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March 1985

United States Air Force
Personnel Force Composition Study:

An Analysis of the Effects of Varying Male and Female Force Levels

ANNEX FIVE:

Organizational Assessment Study

prepared for the

USAF Special Study Team
Headquarters,

SRA
CORPORATION

ORGANIZATIONAL ASSESSMENT STUDY

February 1985

Prepared for:

The U.S. Air Force Special Study Team
(HQ USAF/MPZ)

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The views, opinions, and findings contained in this report are those of the authors and should not be construed as an official Department of Defense position, policy, or decision, unless so designated by other official documentation.

ORGANIZATIONAL ASSESSMENT STUDY

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PREFACE

In July of 1984, the United States Air Force asked Systems Research and Applications (SRA) Corporation to conduct a sweeping analysis of the effects of enlisted women in the Air Force. The Organizational Assessment Study was developed as part of a larger Air Force examination of issues related to women, which was initiated at the request of Congress.

SRA subcontracted NORC of the University of Chicago to assist in the design and collection of a worldwide survey of enlisted personnel. Work commenced in August, beginning with an overall research plan that isolated the key policy issues and data requirements. The SRA and NORC staffs developed the questionnaire and designed the sampling plan by late September, after which they conducted extensive pretests. The survey was administered between late October and early December, 1984. Intran Corporation optically scanned the survey answer sheets and delivered a data file to SRA at the end of December. SRA conducted the empirical analysis during January and delivered an Interim Report to the Air Force on 4 February, and a Draft Final Report on 14 February, 1985.

This report documents the Organizational Assessment Study from the review of the literature, to the execution of the survey, and through the multivariate analysis. The results shed considerable insight into the functioning of work groups, as well as the role of women in the Air Force. The study serves as a solid base on which to evaluate alternative personnel policies.

ACKNOWLEDGEMENTS

The data collection analysis conducted for the Organizational Assessment Study benefited greatly from the advice provided by individuals outside of SRA and NORC. In particular, members of the U.S. Air Force Special Study Team provided valuable guidance, assistance and information during the project (specific individuals are cited in the study team's report to Congress). Dr. David Armor of National Policy Analysts helped design the survey questionnaire and shape the analysis plan. Ellwood B. Carter and Richard Rubin of NORC and Gary Nelson and Ann Rowley of SRA Corporation also contributed greatly to the study.

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1. INTRODUCTION AND OVERVIEW

The Organizational Assessment Study examines the effects of enlisted women in the Air Force. Its primary purpose is to help policy makers evaluate the changes that might occur in USAF work groups if the mix of men and women were altered. The study examines four general outcome measures: individual commitment to the work group and to the Air Force, individual performance and availability, group performance and morale, and sexual harassment.

The Organizational Assessment Study is the largest and most encompassing examination of the effects of women that the Air Force has sponsored. The timing of this research is opportune. From 1973 to 1980, the percentage of enlisted women in the Air Force increased fourfold to just over 11%. Since 1980, the ratio has remained fairly constant in the Air Force, as well as in the other Services. The recent period of stability and adjustment provides an excellent opportunity to examine the role of women without confounding the results with the turbulence created by the rapid integration of women during the 1970s. The evidence generated by this analysis should provide a solid base for future research in this area.

The remainder of this chapter gives an overview of the study and summarizes its principal findings. It is organized into four sections:

- Analysis Approach
- Survey Design and Results
- Key Analysis Findings
- Organization of the Report.

1.1 ANALYSIS APPROACH

Because work groups are the basic organizational building blocks of the Air Force, the study results could help to improve the effectiveness of personnel, raise the productivity of work groups, and thereby increase overall performance and readiness.

Several criteria govern the design of the study, building, in part, on the extant literature reviewed in Chapter 2:

- First, no single objective measure of performance exists -- performance is multifaceted in nature and requires development and analysis of several indicators.
- Second, reliable estimates of the effects of women in the Air Force are best obtained by evaluating individuals under normal conditions rather than under short-term experiments.[1]
- Third, to avoid biased results, the assessment of the influence of women on group performance requires extensive control for important differences in group characteristics.
- Fourth, analysis should be based on a scientifically selected sample of enlisted personnel that is of sufficient size and breadth to be representative of the overall force.
- Fifth, investigation of the effects of women should not rely on individuals' impressions of female performance because of the danger that attitudes and prejudices may jeopardize the accuracy of the responses. Instead, multivariate analysis should be employed to estimate the major personal and group correlates of performance.

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[1] As noted in Chapter 2, previous studies have evaluated the effects of women in selected Service work groups under experimental conditions that did not replicate normal operations or the regular complement of group members. Hence, the findings are subject to error and are difficult to generalize to the overall force.

Within this general framework, the study examines four areas related directly or indirectly to group performance. Several dimensions of each area are analyzed to embrace a wide range of potential effects associated with changing the mix of enlisted men and women in the Air Force. The four general areas and their respective components define the outcome or dependent variables of the analysis:

- **Individual Commitment**
  - --Desire to transfer out of the work group
  - --Desire to leave the Air Force before completing a service obligation
  - --Expected career length
- **Individual Performance and Availability**
  - --Ability to deploy quickly
  - --Availability for temporary duty (TDY)
  - --Lost work time
- **Group Performance**
  - --Ability to deploy quickly
  - --Morale
  - --Work around (individuals "not carrying their own weight")
- **Sexual Harassment**
  - --Verbal harassment
  - --Physical harassment.

Within the context of these measures, the primary objective of the study is to shed light on specific issues related to women in the Air Force. Some of the most salient include:

- How does the performance, availability, and commitment of men and women differ?
- How does marital and dependent status affect the performance, availability, and commitment of personnel?
- Are group performance and morale affected by the male-female composition of a group, or by group size?

- Is the individual commitment of men and women to their work groups and to the Air Force affected by the concentration of women in the group?
- Do the sex and quality of a group's supervisor affect individual and group performance?
- Are there predominant patterns in individual and group performance across functional areas after controlling for other differences?

The multivariate analysis evaluates these and other questions in detail.

Several key individual and group characteristics are especially important to the Air Force for evaluating policy and responding to congressional inquiries. To obtain unbiased estimates of the effects of these key variables, the multivariate analysis controls for a rich set of individual and group characteristics. These include:

- **Key Variables**
  - --Gender of an individual
  - --Mix of men and women in a work group
  - --Sex of a group's supervisor
  - --Size of a work group
  - --Quality of a group's supervisor
  - --Functional area of a group.
- **Group Variables**
  - --Composition by sex-marital-dependent status
  - --Presence of officers and civilians
  - --Relative group experience (Ratio of E3 and below to all enlisted)
  - --Work schedule
  - --Pace and stress of work
  - --Racial composition
  - --Physical demands (strength requirement, exposure to dirt on the job)
  - --Work environment (hazardous, outdoors, extreme temperatures)
  - --Personnel and equipment shortages
  - --Type of work group.

- **Personal Variables**
  - --Education
  - --Family status (marital and dependent)
  - --Pregnancy status of member or spouse
  - --Race
  - --Years of service
  - --Whether or not respondent is a supervisor
  - --Air Force Specialty Code (AFSC)
  - --Whether respondent also has a civilian job.

Given these research objectives and data requirements, SRA, in collaboration with NORC of the University of Chicago, designed the 1984 Survey of Air Force Work Groups.

1.2 SURVEY DESIGN AND RESULTS

The Survey of Work Groups collected data from almost 12,000 Air Force enlisted persons around the world, yielding a sample representative of all active duty personnel assigned to bases in the fall of 1984. Over 83% of the initial sample participated in the survey (excluding those who died or left the Air Force). Moreover, analysis found little evidence of nonresponse bias.

Confidence intervals can be constructed around an estimated proportion with considerable precision.[2] Therefore, conclusions drawn from the research can be generalized with confidence to the Air Force enlisted population, except for personnel excluded from the sample (students, those assigned to activities outside the Air Force, and those in Geographically Separated Units).

Sample Design. Chapter 4 discusses the two-stage, stratified probability selection procedure developed for the Survey of Work

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[2] The least precision is obtained for proportions close to .50. In this case, the 95% confidence interval would be: .50 ± .027. Greater precision is obtained as the estimated proportion approaches either 0 or 1.

Groups. A stratified sample of 30 out of 120 Air Force bases around the world was randomly selected -- 22 in CONUS, 1 in Alaska, and 7 overseas. Within each base, women were sampled at twice the rate of men to obtain sufficient numbers of both sexes to support the analysis objectives. Data were weighted to accoun for this over-sampling.

From each of these chosen bases, 488 individuals were selected for participation in the survey, yielding a probability sample of 14,639 individuals. Strict random probability sampling methods were employed to ensure that every individual in the defined population had a known, non-zero chance of being included in the sample. To preserve the integrity of the sample, substitutes were not permitted for selected individuals who did not participate in the survey.

Survey Procedures. Chapter 3 describes the development of the questionnaire and the data collection procedures. Participants in the Survey of Work Groups completed a written questionnaire administered in group settings by the NORC intervie staff who answered questions and helped participants focus on their respective work groups.[3] This focus was crucial to the study because of the analytical interest in analyzing group performance.

Group-administered surveys were conducted during a one-week period at each base. Individuals unable to attend the sessions were subsequently contacted by the base Survey Control Officer an administered the questionnaire. This follow-up activity contributed to the survey's high response rates.

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[3] A work group is defined generally as the small group of people with whom the respondent works on a daily basis toward a common mission. It typically contains under 20 people, working on the same shift, with the same functional account code, and reporting to the same supervisor.

Survey Response Rates. As reported in Chapter 4, survey coverage of the eligible sample members was excellent, despite adverse circumstances including a typhoon, a major fire, and various operational readiness inspections. Based on the initial sample of 14,639 persons (less the 3% who died or left the Air Force), 83.4% participated in the survey. Nonparticipants were unavailable principally because of PCS moves (5.1% of the initial sample). If these are excluded from the sample base, the calculated participation rate rises to 88.2%. The other major reasons for nonresponse include temporary duty assignment (3.9%), leave (2.0%), mission necessity (.7%), refusal to participate in the survey (.7%), and reason unknown (3.5%).

The high response rate, combined with the acceptable reasons for nonparticipation, suggest a low potential for nonresponse bias in the survey data. Comparisons between the initial sample of 14,639 and the completed sample of 11,775 show a close correspondence between the two. The distribution of males and females in the completed sample across pay grade, functional area, and geographic area ~~is~~ very close to that of the initial sample. Hence, there is no evidence of nonresponse bias in the survey data with respect to these dimensions.

Supplementary Enlisted Interviews. A subsample of 801 persons, selected randomly from the main sample, was interviewed by the NORC staff.[4] These interviews probed the topics covered in the questionnaire in greater depth, especially issues dealing with the effects of gender. Data from the personal interviews are used selectively in the empirical analysis to provide greater insight.

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[4] Interviewers and respondents were matched according to an experimental design to assess any effects of response bias due to the interviewer's sex. Analysis reported in Chapter 3 finds no empirical support for such concern.

Senior Officer Interviews. Two senior officers at each of the 30 selected bases were interviewed by NORC staff. The collected data yield insights from the perspective of the officers with command responsibility for the enlisted personnel participating in the survey. Chapter 10 describes the analysis of the senior officers' responses. The findings generally corroborate the results obtained for enlisted personnel, although the results from these 60 officers should not be generalized to all senior commanders.

Other Study Populations. In addition to the main survey effort, two additional groups were surveyed as case studies. Data for these groups are not analyzed in this report but will be the subject of future work:

- **Enlisted Personnel at GSUs** -- A sample of 1,996 enlisted personnel serving in Geographically Separated Units (GSUs) was mailed the same written questionnaire used in the Survey of Work Groups. The GSU sample consists of individuals associated with the 30 bases included in the main survey (supported by the Consolidated Base Personnel Office), but who work off the base. The GSU data will support statistical tests for systematic differences between individuals and groups working on-base versus off-base.
- **Enlisted Personnel at Korean Bases** -- A total of 1,038 enlisted personnel were selected from two Air Force bases in South Korea. The Base Survey Control Officer had responsibility for distributing and collecting the same written questionnaire used in the main survey. The data will support future analysis of individuals and groups at overseas bases in isolated locations. Because these individuals are geographically isolated and have shorter tours than most, they may experience unique problems that could affect the utilization of women.

The data assembled from the Survey of Work Groups, along with the interview data from enlisted personnel and senior officers, constitute the analysis file for this report.

1.3 KEY ANALYSIS FINDINGS

An overall picture of commitment, performance, and morale in the Air Force is provided by some general statistics. Males appear to have a greater degree of satisfaction with the work group than females: 31% of Air Force enlisted men and 38% of enlisted women would like to transfer out of their work group. In contrast, there is little difference in commitment to the Air Force, as 22% of enlisted men and 24% of enlisted women report they would like to leave the Air Force early.

Respondents' perceptions of their own performance show that 92% of enlisted men and 82% of enlisted women believe they could deploy quickly if necessary. Furthermore, 86% of enlisted individuals report that all or most of their group could deploy quickly if necessary. Regarding another performance measure, 30% of enlisted individuals report missing some scheduled work time for a variety of personal reasons, but little difference exists between the sexes.

At current female levels, both enlisted personnel and senior officers view gender and family-related factors as much less important when compared with the range of other factors that adversely affect group performance. Among the enlisted population, 2.9% point to a gender or family situation as the most important problem affecting the functioning of their work group.

Gender. The multivariate analysis examines gender from two perspectives: male-female differences in individual performance and availability; and its group analog, differences in group performance by the concentration of men and women. The results form a consistent and reinforcing picture of the effects of women along specific dimensions of performance and commitment.

Controlling for other personal and group characteristics, the analysis finds that the presence of women has a negative effect on mobility and availability. In particular, women are less able to respond quickly to deployment and are less available for TDY than similarly situated men. From the group perspective, the analysis finds that the likelihood of all members of a group deploying quickly declines as the proportion of women increases.

In terms of group performance, the analysis finds more work around in mixed groups than in all-male groups, holding other factors constant. The likelihood of work around is also sensitive to the combination of group size and the proportion of females in the work group. In relatively large groups, a greater proportion of women raises the probability of work around, while in smaller groups, it has the opposite effect. Given the presence of work around, males in mixed groups report that the problem becomes more widespread as the proportion of females increases.

In contrast, there is no significant difference between men and women regarding their commitment to the job as measured by work time or to the Air Force at large. Specifically, the analysis finds no significant gender differences in missed work hours, the desire to leave before completing an obligated tour of service, or career length expectations. The sole exception to this general finding is that enlisted women with at least 8 years of service plan to remain two years less than their male counterparts.

Females are more likely than males to express a desire to transfer out of their work group, after controlling for other personal and group factors. This propensity may reflect either an individual's dissatisfaction with the group or that women generally have higher expectations and standards of performance and morale than men. The latter is consistent with the finding that women, on average, rate their group lower in terms of morale than do men.

The analysis finds that the proportion of women in a work group is not related to group morale. However, a higher concentration of women is associated with a greater tendency of both men and women to want to leave the work group.

Family Status. The analysis finds that family status explains much of the difference between male and female performance. Moreover, the family status of group members is also found to influence measures of group performance. The largest effect is that pregnant female members and single male and female parents are less able to deploy quickly, are less available for TDY, and tend to miss work more frequently than other personnel. The same effect holds for married women with dependents regarding their availability for mobility and TDY. Group mobility is also affected by the family status of its members, although not as strongly as individual mobility and availability. The presence of single women with dependents, members with a military spouse and children, and members with a civilian spouse, however, are estimated to reduce group mobility.

There is little systematic pattern between the family status of individuals or group members and individual commitment and group morale. The primary effect appears to be limited to availability and deployment demands that conflict with family responsibilities. One of the chief constraints on women in the work group may be the societal custom that child care responsibilities reside primarily with the female.

Group Size. Group size has a direct effect on several indicators of group functioning: mobility, work around and morale. Increasing the size of the group, to some extent, raises the chance of at least one member not "carrying his or her own weight". The negative link between these indicators of group function and group size suggests that bigger groups may be less cohesive and may not interact as well as smaller groups.

Sex of Supervisor. Multivariate analysis finds that the sex of a group's supervisor has no statistically significant effect on any of the outcome measures under study. Thus, supervisor gender appears to have no effect on individual and group functioning.

Supervisor Quality. The quality of supervision is strongly related to almost all performance indicators, except individuals' TDY availability and missed work hours. This confirms the key role of leadership at the work group level. However, it may be misleading to infer causality from the empirical results because the analysis relies on a single survey respondent to report on all aspects of group functioning, some of which are based on subjective evaluations. Hence, strong positive or negative feelings about the group could pervade the subjective rankings of the respondent. The strongest conclusion to draw from the findings is that supervisor quality is highly correlated with virtually all dimensions of performance.

Functional Area. In contrast to some of the tabular analysis, the regression analysis finds few patterns in performance and commitment by functional area.[5] This suggests that when other individual and group characteristics are taken into account, a group's functional area is not significantly related to performance or commitment, adding little to the predictive ability of the model (i.e., for a given set of group and personal characteristics, the effects are similar for almost all functional areas).

Characteristics of the Work Place. The analysis finds a distinct pattern in the level of performance and commitment across important characteristics of the work place: job stress, job pace, personnel shortages, and equipment shortages. The consistent influence of these factors warrants attention, although some may be inherent in a group's mission and thus not easily changed.

Stressful jobs have an unfavorable effect on individual commitment, group performance, and group morale. In contrast, fast-paced jobs have a favorable effect on individual commitment, group performance, and group morale, while slow-paced jobs have an unfavorable effect. Both equipment and personnel shortages have a negative effect on individual commitment, group performance and morale.

Individual Characteristics. There do not appear to be any noticeable trends across other individual characteristics tested by the regression models. Years of service is found to have an effect across three major analysis areas, but this is expected because, generally, commitment and performance tend to be correlated with experience, and attrition often eliminates poor performers.

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[5] Functional area refers to where an individual works rather than the specific tasks performed by the individual (i.e., a group-specific rather than job-specific measure). For example, a clerk might work in the civil engineering functional area.

1.4 ORGANIZATION OF THE REPORT

To establish a historical backdrop for the study, Chapter 2 reviews the relevant literature dealing with women in the military. The survey methodology and procedures discussed in Chapters 3 and 4 build on the knowledge gained from previous research. Chapter 3 describes the rationale and development of the survey questionnaire, and documents the procedures followed during the data collection. Chapter 4 discusses the methodology used to select the major and secondary samples, and evaluates the results of the survey effort.

The remainder of the report turns to the analysis of the survey data. Chapter 5 introduces the analysis by defining the specific objectives of the research, identifying the key variables of interest, and discussing the statistical procedures. Discussions of the tabular and multivariate analysis results are contained in Chapters 6 through 9, which focus on the four general analysis areas.

Chapter 10 shifts the focus to an analysis of data collected from senior officers with command responsibility on the 30 bases from which the enlisted sample was selected. The perspectives of the senior officers on issues related to women are a useful counterpoint to those obtained from the enlisted personnel. Chapter 11 concludes the report by summarizing the key analytical findings regarding the effects of women in the Air Force.

2. SELECTED REVIEW OF THE LITERATURE

This chapter provides a context for SRA's analysis of the 1984 Air Force Survey of Work Groups. The literature review limits its focus to studies of the performance of military women, both as individuals and as members of groups, conducted after the mid-1970s. This focus is relevant to our study because of the uniqueness of the military and the dramatic increase in the proportion of women in the military after 1973. Finally, the literature review places greater emphasis on large-scale research efforts and generally ignores small case studies because these studies cannot be generalized beyond the specific restrictions of the sample.

The following discussion is organized into three parts, summarizing the relevant Army, Navy, and Office of the Assistant Secretary of Defense (OASD) research. No pertinent literature has been published by the Air Force. The selected literature review aims to encapsule the relevant study results, describe the research approaches, point out their deficiencies, and finally, summarize the state of extant literature in order to guide research.

2.1 STUDIES OF WOMEN IN THE ARMY

This section reviews two major studies on the effect of women on group performance conducted by the U.S. Army Research Institute, MAX WAC and REFORGER 77, two case studies on the effect of gender integration in the Army, and a recent study by the Army for its policy review.

2.1.1 MAX WAC

The Women Content in Units Development Test (MAX WAC) was the U.S. Army's first major examination of the effect of women or group capability, completed by the U.S. Army Research Institute (ARI) in 1977. The focus of the study was the specific effect that a group's gender ratio has on its ability to perform its duties under field conditions, and as such, the study tested the null hypothesis that specified increases in the percentages of women in selected units do not impair unit performance.

To test this hypothesis, 40 combat service and support companies participated in three-day exercises in 1976. Equal numbers of companies were chosen from medical, maintenance, military police, transportation, and signal units.[1] The ARI separated each unit into three kinds of companies:

- **Experimental** -- Two companies were tested with initial compositions of 0% and 15% women, and then were retested six months later with the percentages of women raised to 15% and 35%, respectively. The observations of these companies provided the basic test of the null hypothesis, with each company, to some extent, serving as its own control.
- **Control** -- One company participated twice, with the second exercise occurring six months after the first to measure the extent to which companies learn by repeating an exercise. Its composition of women was kept constant throughout the experiment.
- **Calibration** -- Five companies were tested once, each with their percentages of females ranging from 0% to 35% so as to discover the range of performance scores.

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[1] In order to avoid confusion, "units" will refer only to these five occupational groupings.

The ARI gathered three types of data from these exercises: (1) company scores on the Army Training and Evaluation Program (ARTEP) rating module;[2] (2) questionnaire responses from the participants; and (3) general observations that were not part of the standard ratings.

ARTEP Ratings. The major finding of the study was that the ratio of females in a unit had no statistically significant effect on that unit's performance, as measured by the ARTEP evaluation.[3] Specifically, the performance of the average experimental company with no women was insignificantly worsened with the addition of 15% women. The ratings of the average experimental company with 15% women (initially) increased insignificantly when the fill of women was raised to 35%. Though this might suggest that the true relationship between group performance and the ratio of women was U-shaped, regression analysis found no basis for this claim.

Control companies, in general, did insignificantly worse on the second test than the first. Although the percentages of females in these companies were not, in general, perfectly stable, the fluctuations were random. This suggests that there was no substantial bias due to repeated testing. The ARTEP ratings of the calibration companies showed relatively little fluctuation (by unit) about the means set by the experimental companies, with absolutely no variation by the percent female.

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[2] The ARTEP consists of the normal field exercises given to est the combat support capability of each kind of unit. A ypical task is for an advance party to enter an unsecure rea.

[3] Throughout this review, any mention of significance relies n the outcome of a two-tailed test at the 5% level.

Questionnaire Responses. The gender ratio of a group also failed to explain performance, as measured by the subjective ratings of performance gathered from the questionnaire responses. Each participant was asked to assess the performance of his or her company during the exercise. The answers given indicated no statistical difference by percent female. This was the case not only on average, but also for both NCOs and other enlisted personnel, and for both males and females. Although the tendency to rate companies with 15% women inferior to those with more or fewer women was again present, estimated parabolic relationships between performance and the ratio of women were again not significant.

The questionnaires did show, however, that officers, NCO supervisors, and other enlisted men deemed the performances of the women in their company inferior to that of the men. These responses suggest that either sexual bias existed or that performance was maintained despite inadequate personnel. Further, the lower the grade of the respondent, the more of a difference between the perceived performances of males and females. It is unclear whether this distinction was due to lower-ranking personnel having either less education and previous exposure to women (and perhaps more bias) or more exposure to the women on the exercise (and thus more knowledge of their work).

If the latter is true, perhaps the men in mixed-sex companies had to work around the women. This conclusion is at least partially supported by the questionnaire responses. Men reported spending significantly more hours performing 6 out of the 10 field tasks common to all companies and all common tasks as a whole. Although men in mixed-sex companies worked longer at common tasks than women, they worked no longer, on average, than the men in single-sex companies. Hence, men worked longer hours on common tasks, on average, than did women, but this difference appears to be independent of any gender-related work around problem.

It is also interesting that when asked to rate the relative effects of various factors on unit performance, the officers overwhelmingly considered leadership, training, morale, and personnel turbulence to be more important than the percent female. Moreover, 88% of those responding felt that the gender ratio of a unit accounted for, at most, 10% of the variability in performance.

Evaluator Comments. The general observations made by the test evaluators included the following:

- Enlisted women were more likely to be treated as equals in units with higher percentages of women.
- Enlisted women were more readily integrated into groups that were overtasked or undermanned.
- Supervisors' assignments of women's tasks were very traditional, leading to assignment inflexibility, raising the issue of a double standard, and lowering overall morale.
- Enlisted women were more accepted by enlisted males in companies that were commanded by officers and NCOs who accepted women.

Caveats. One of the problems with this study is its failure to control properly for all of the determinants of performance. ARTEP ratings varied qreatly as a result of differences in the workload and difficulty of each unit's tasks, the assignment of women to functional areas within each company, and the amount of practice that each company had before the exercise. In addition to variation on a company and unit level, omitted variable bias resulted from lack of control for individual characteristics. None of the females had participated in the complete and integrated basic training program. They were, however, of higher average aptitude than the males, as defined by Armed Forces Qualifying Test (AFQT) score and high school graduation status.

Another potential flaw of the study design is the artificial implementation of the experiment. The shortness of the exercise, coupled with each company being tested at most twice, could make the results indicative of only temporary phenomena. Companies were not tested for the effect of women on a permanent basis. Moreover, the necessary fills of women were often achieved without giving units ample time to stabilize after the addition of women; the fills of women created a greater percentage of women at lower grades than would occur if the tested proportions were Army-wide; and fills were made without consideration of the percentage of females within each MOS.

The MAX WAC results cannot be generalized to the entire Army or to the other Services because the performance of only five occupational units was evaluated. Further, the small sample size of 40 companies (in fact, the experimental and control companies numbered only 15) reduces our ability to project the results to other Army companies with much statistical accuracy. Finally, the methodological issue of the appropriateness of the company level of aggregation as the research focus is important. Perhaps a focus on smaller, more cohesive groups of workers at the sub-company level would have yielded greater insight into the effects of women on unit performance.

2.1.2 REFORGER 77

To correct some of the shortcomings of the MAX WAC study, the ARI observed the annual REFORGER (Return of Forces to Germany) scenario in 1977. This 30-day exercise included the 10-day field training exercise (FTX) CARBONEDGE, a realistic war game with division-sized forces. The ARI lengthened the period of study to examine whether the results gained from MAX WAC's shorter exercise held true for an extended exercise, or whether the performance of females would deteriorate over time.

The purpose of the study was broadened to learn not only if a group's performance is independent of the inclusion of women, but also if an individual's performance is independent of gender. As a result, two null hypotheses were tested: (1) there is no difference between the performances of all male and mixed (containing at least one enlisted woman) groups, either over time or at any point in time; and (2) there is no difference between the performances of individual enlisted men and women, either over time or at any point in time.

To examine these hypotheses, a sample of approximately 2,900 personnel, including 299 women, was selected to participate in REFORGER 77, with the stipulation that personnel assignments could not be changed prior to the exercise.

The sample was aggregated into units defined by occupation and by the type of work performed within each unit. On the REFORGER exercise, as in the MAX WAC study, maintenance, medical, military police, signal, and transportation units participated. In each unit, tasks were catalogued as common (sustenance and tactical activities engaged by all units) and unique (MOS-related activities performed primarily by specific units). Further, work was distinguished by the exposure to stress during the exercise, denoted by the adversity of conditions and the number of relocations each company experienced. Because the data showed that these two factors were highly and positively correlated, the study equated relocation with stress.

The study employed data from five major sources:

- **Group Event Rating Forms** -- Evaluators measured group performance on specific events, using a rubric similar to the ARTEP module. Although an effort was made to match groups by mission and experience, this proved impossible because ARI evaluators were not permitted to interfere with the exercise. This prohibited the introduction of special scenarios and tasks and thus limited the availability of matched observations. Therefore, researchers focused on events that were likely to occur for both mixed groups and for one or more all-male groups.

- **Individual Event Rating Forms** -- ARI observers rated individual performance on certain events according to a scale similar to that in the ARTEP tests. The disallowance of special tasks also affected this data. It was not always possible to match individuals by company, grade, time in the Army, age, General Technical score, and MOS. Thus, individual evaluations were first made on an enlisted woman, and then on the first enlisted man performing the same task if a matched man was not available.

- **Daily Record of Performance** -- NCO supervisors rated each female and matched male (as described above) in their work group on overall performance for each day of the FTX. Because there was no constraint on a supervisor's observing the performances of the members of his/her company, this data base was more carefully controlled than that of the ARI ratings.

- **Questionnaire Responses** -- Questionnaires were distributed to enlisted personnel, NCOs, and officers, both before and after the exercise.

- **Other Data** -- NCO supervisors gathered daily statistics on deployability and work availability.

Group Ratings. The major finding of the survey was that the presence of female soldiers did not impair the performance of combat support and combat service units when mission performance was defined in terms of the REFORGER 77 scenario. There was no statistically significant discrepancy between the average ratings received by all-male and mixed groups at any point during the exercise or for the entire period. This result was basically unaffected by grouping data by the type of task or by the stress experienced.

Individual Event Ratings. There were no systematic male-female performance differences on individual events. Indeed, the data revealed no significant distinctions by sex in units, both at any time or over the duration of the exercise, regardless of type of task or stress exposure.

Individual Daily Performance. The daily performance ratings echoed the above results, as daily performance ratings were significantly and positively correlated with individual event ratings. These records, which were more convincing because they compared only matched individuals, demonstrated no consistent difference between the performances of the average male and female, either over time or at any point in time.

Questionnaire Responses. The questionnaire data, to some extent, corroborated the results of the field testing. About one-half of the officers and one-third of the NCOs felt that there was no male-female difference in performance or the likelihood of a deterioration in performance. However, approximately one-third of the officers and two-fifths of the NCOs deemed the performance of the men to be superior. About one-fourth of the officers and one-third of the NCOs felt that the performance of women was more likely to erode with time. In fact, when account was taken of the frequency of work with women by the NCOs, exposure to women augmented perceptions of superior male performance.

Hence, ARI observers found the performance of men and women to be equal, but women were rated poorly by men of all grades, with the view of women being positively correlated with the men's rank and negatively related to the degree of contact within each rank. These observations are supplemented by other results of the questionnaire, which measured the respondent's attitudes of appropriate sex roles for women in the Army. Enlisted males had substantially more negative attitudes towards women than either NCO supervisors or officers, and in fact, these attitudes were exacerbated during the exercise.

Also of note is that a substantial percentage, about 40%, of all grades and sexes reported that men and women received different treatment from NCOs. Of those who perceived a difference in the treatment given, roughly one- to two-thirds of the males contended that that NCOs gave women more privileges, easier jobs, help on the job, and more attention to personal problems. About two-fifths of the females reported that women received less favorable treatment than men from their supervisors. These findings remain true of the perceptions of preferential treatment given to the opposite sex by officers. This suggests that the incorporation of women into the Army causes additional personnel management problems. Almost all data supported this view, as there were many cases reported of women who were not assigned to any duties by their supervisors, and 23% of the participating women were trained in a nontraditional MOS (for a female), but were placed in a traditional MOS for the exercise.

Other Data. Another important issue is the relative availability for duty of men and women. The record of hours in which enlisted personnel were not available for work showed that enlisted women were available for less work than matched enlisted men.[4] However, the difference was statistically insignificant.

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[4] This was mainly due to the fact that women were unavailable for reasons of illness about five times as often as were men.

A final availability concern is that of deployability. The data gathered by NCO supervisors showed that women were almost twice as likely to be non-deployable as were men. Only 71% of the women and 85% of the men available for the exercise were deployable; 11% of all women were non-deployable for personal reasons as compared with 2% of men.

Caveats. The primary problem with REFORGER is its lack of proper experimental control. This problem manifested itself in four major areas:

- **Group Characteristics** -- Because of the constraint on task introduction, groups were not always properly matched for comparison in the events observed by ARI evaluators.
- **Individual Characteristics** -- Males and females were often not matched for the ARI observations.
- **Gender Composition** -- No specific information on the percent female in mixed groups was gathered; therefore, any variation by percent female within the mixed groups was ignored.
- **Task Assignment** -- Because special tasks were not allowed, tests were restricted to activities that mixed groups and individual females were likely to perform. This biased the estimated effect of women on overall unit performance if the females did not engage in every action proportionally to its occurrence.

Finally, generalization of the results is restricted by the relatively small number of females present and their limited assignment. It is also important to remember that this was only a test of five types of units on field performance. Generalization of the findings are subject to the same caveats as the MAX WAC study.

2.1.3 Case Study: A Basic Training Camp

One of the problems with both of the ARI studies is their concentration solely on the number of females incorporated into a group, with no consideration of the manner in which they were integrated. Green and Wilson (1981) examined how the effects of gender integration on a squad, platoon, and company level (and above)[5] on company performance and attitudes differ, as a result of both the amount and nature of contact with women.

In 1979, Green and Wilson gathered data from a stratified random sample of 813 soldiers (231 females) in basic training on a Georgia Army base. The data included two measures of performance (a final exam of basic skills and a physical fitness test) and attitudinal measures (a rating of satisfaction and a scale of views on appropriate roles for women). Green and Wilson analyzed the effect of gender on these indicators within each integration context, while controlling for age, race, education, and AFQT score.

The results showed that the level of company integration exerted a significant influence on the dependent variables, but the relationship was not monotonic. Integration by squad not only produced the least amount of discrepancy by gender in performance and attitudes, but also greatly increased the satisfaction and effectiveness of the women while keeping that of the men constant (relative to integration by company). Integration at a platoon level exacerbated the gender differences and resulted in the lowest absolute levels of performance and attitude indicators for both men and women. This is consistent with the view that it is not only the amount of contact with women that is important, but also its social context.

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[5] Thus, in company-level integration both squads and platoons are segregated; integration by platoon denotes segregation by squad; and in squad-level integration, all squads are mixed-sex.

The authors suggested that intersquad, as opposed to intrasquad, competition had the greater effect on individual soldiers. Segregation by squad added sex competition to usual intersquad competition, stressing different performance and resulting in lower morale and still lower performance. They posited that some competition between the sexes was beneficial, and so integration by squad produced the best results because it coupled sexual competition on an individual level with male-female cooperation on a squad level.

It must be remembered that this is only one explanation of the data. However, platoon-level integration definitely isolated the women and stressed the differences between the sexes. The females were distinct from the males not only because they were a minority, but also because they were separated in the most important organizational fashion (by squads).

2.1.4 Case Study: A German Outpost

This theme of isolationism runs throughout the literature on women's moving into previously all-male institutions. Rustad (1982) examined the integration of women at a single Army outpost in Germany and found that the nominal presence of women caused a tense and unproductive environment. Through a set of questionnaires and personal interviews gathered in 1979, he found that women felt alone within the predominately male Army base, which was compounded by the structural separations from civilians and the local populace.

Although his findings are subject to the qualifications inherent in a case study, the results provide some useful insights. He observed that most women felt that they were forced to prove themselves because of their gender. Over one-half of the women had directly experienced sexual harassment while on duty, but few of these instances had been reported, due to fear of retaliation. According to Rustad, this was indicative of the treatment of women: the women experienced heightened visibility because of their small numbers, which only fueled their isolation.

This cycle led to two forms of behavior among the females. The first was one of overachievement in which sexuality was submerged. These women, continually reminded of the gender difference, tried to eliminate it by taking on a masculine identity. The second group of women were underachievers. These women totally submitted to the gender distinction, accentuating their feminity in order to conform to expectations. They would only perform light tasks and would often accept the advances of their male supervisors and peers.

These findings are consistent with many others from the private sector.[6] These studies showed that when women initially entered previously all-male institutions, they were viewed as stereotypes, and thus became isolated, lost their individuality, adopted overachievement or underachievement roles, and felt pressure to conform. When the percent female in the group rose to approximately 30%, social problems were not likely to develop and the women became very productive.[7]

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[6] These include Ruble and Higgins (1976), Thomas and Prather (1976), Webber (1976), Kanter (1977), and Spangler (1978).

[7] This does not imply, though, any causal link. It might be that these results demonstrated that an adjustment period may

2.1.5 Women in the Army Policy Review

This 1982 study by the Army Office of the Deputy Chief of Staff for Personnel examined the utilization of women from the perspective of job requirements. Specifically, the study addressed the requirements of strength and combat exposure that limit the effective use of women in the Army.

The study primarily examined the strength demands of each MOS to construct a gender-blind linking mechanism between individual physical capacity and physical work requirements. The study found that women were, in general, not as strong as men and were subsequently more likely to be incapable of performing physically demanding jobs than were men. The implicit and untested hypothesis was that physical mismatches of individuals and jobs result in decreased group effectiveness. This relationship, however, was not addressed by the study.

2.2 STUDIES OF WOMEN IN THE NAVY

This section reviews some of the surveys conducted by the Navy Personnel Research and Development Center, which address the effects of gender ratio, type of work, and pregnancy on some measures of satisfaction and commitment; and the results of the Navy's experiments with women aboard ships.

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be necessary for a productive social environment.

2.2.1 Longitudinal Survey of Satisfaction and Commitment

The Naval Personnel Research and Development Center (NPRDC) has performed extensive research on the integration of women, but much of it is incomplete or only tangentially relevant to our analysis of the 1984 U.S. Air Force Study of Work Groups. Most of the NPRDC studies are longitudinal, focusing on the first tour of duty of a sample of approximately 1,000 men and women who entered the Navy in 1975. Analysis of the four-year observation period by Thomas (1982) examined the effects of work type (how traditionally female it is) and group gender ratio on the work behavior and satisfaction of women in the Navy.

The data used to determine these effects were gathered from two sources: (1) a 1976 survey distributed to only women, (2) a 1979 survey distributed to both men and women, and (3) a quarterly personnel record for each member of the sample. For analysis purposes, work group gender ratios were condensed into three comprehensive categories, defined as male-dominated, in which at least 60% of the group was male; female-dominated, wherein the group was at least 60% female; and balanced.

The data revealed no significant differences in women's job satisfaction, reenlistment rates, or attrition rates between traditional and nontraditional occupations.[8] In addition, the data indicated that work group composition had no significant effect on women's satisfaction and reenlistment.

The study also addressed the question of the relative availability of men and women. It concluded that insignificantly more women left the Navy before completing their obligated term of service (3% difference), significantly more men reenlisted (6% difference), and that women missed significantly less work (2.81 days per year difference). Thus, it was unclear which sex contributed more overall time to the Navy.

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[8] Traditional female jobs are defined as those in which the majority of the labor force of its closest civilian sector counterpart is female.

It is unfortunate that the study failed to examine some of the most important issues in this area. Most damaging is the lack of consideration of any measure of group performance or readiness. Even within the confines of the study, however, many areas were overlooked. No mention was made of the effect of group composition on male satisfaction, attrition, and reenlistment. Missing as well is the effect of a group's gender ratio on female attrition. The distinction between traditional and nontraditional occupations, on which most of the study is based, is only of peripheral interest.

Finally, the study blurred the relevant distinctions in the ratio of females across work groups. For instance, this study, even taken at face value, gives no basis for determining the effects of doubling the percentage of females in the Navy because the three categories of work-group composition were so general. Possibly, a great deal of variation within the male-dominated regime existed but was hidden.

2.2.2 Case Study: The Effect of Pregnancy on Morale

Another important issue concerning the integration of women into the military is the effect of pregnancy on the morale and performance of the work group. Certainly pregnancy causes a direct loss in the number of hours that a woman is available, but it is often hypothesized that pregnancy indirectly causes the loss of still more effective hours by undermining group morale, as a result of the female's easier tasks and maternity and convalescent leave with pay.

To determine whether pregnancy has this important secondary effect, NPRDC conducted interviews with male and female personnel in aviation squadrons who had worked with pregnant women. Again, the respondents were catalogued as working in a traditional or a nontraditional (female) occupation, and their attitudes were analyzed separately. The distinction is important, because pregnant women in traditional jobs, which are usually not strenuous, can often work longer than their counterparts in nontraditional jobs can, before giving birth.

Approximately three-quarters of all respondents felt that pregnancy in the work group had no effect on morale, and more than two-thirds felt there was no effect on productivity. Further, 22% and 28% of the respondents thought that pregnancy had only a slight effect on group morale and productivity, respectively. The data revealed no significant difference by type of occupation.

The results, however, are of only limited value because the sample consisted of only 54 people. In addition, it is unclear whether the sample was selected randomly, which is even more critical, given the small sample size. The study also failed to analyze the responses by the percent female in the work group. It could be that the data only showed that having one pregnant female in the work group was not detrimental, but that increasing the number of females would have decreased morale and performance by exacerbating a work around problem or by increasing the chances of having more than one woman pregnant.

2.2.3 Case Studies: Women on Ships

The first of the Navy's experiments with women aboard ships took place on the USS Sanctuary in 1972. Women proved themselves to be as capable as the men, and few integration problems arose. However, since this was a hospital ship, almost all of the jobs filled by women were traditionally female. Further, the women aboard were more strictly screened than average women in the Navy who, at that time, were more strictly screened than average men. Thus, the results showed nothing about the abilities of the average woman recruit to perform her duties or the ship's crew to accept women. These factors seriously limit the applicability of the findings.

More recently, the Navy has tested a more complete integration of women on ships. Unpublished quarterly reports from the captains of the tested ships indicated that despite initial problems, the women have performed competently and have been accepted as both officers and enlisted personnel.[9]

2.3 OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE REPORTS

This section reviews recent reports from the OASD. Unfortunately, these reports are not oriented toward performance. They do, however, provide an overview of the utilization of women in the military.

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[9] These reports are summarized in the 1981 study by the Office of the Assistant Secretary of Defense, Women in the Military.

2.3.1 1981 Report: Women In The Military

Data from a Department of Defense survey distributed to all personnel completing initial training in 1979 showed that two-thirds of all males in traditionally male occupations, nine-tenths of all males in traditionally female occupations, and nine-tenths of all females felt that the average woman should be allowed to work in their AFSC or MOS.

When broken down by physical and mental aptitude, the results were similar. Three-fifths of all males in traditionally male jobs, nine-tenths of all males in traditionally female jobs, and the vast majority of all women thought that the average woman was physically qualified for their occupation. In regard to mental capacity necessary for their occupation, four-fifths of the males and nine-tenths of the females surveyed thought that most women were qualified. Both women (by an overwhelming majority) and men (by a slight majority) believed that women could supervise as well as men. Although the data indicated that the majority of men believed women to be qualified for the Services, there was a minority who reported that women were mentally and physically unqualified for their occupational specialty.

Lost-time data was ambiguous and sketchy: the Navy and Marine Corps reported that men on average lost more time than women, whereas the Army and Air Force indicated the reverse. The study hypothesized that there was probably great gender bias present in the reporting of the data.

2.3.2 1983 Report: Military Women In The Department of Defense

According to this Department of Defense study of enlisted personnel, women in the 1980 accession cohort in the Air Force and the DoD as a whole had attrition rates 6 percentage points higher than men. The men in most Air Force and DoD accession cohorts had slightly higher cumulative retention rates than women. Finally, for the DoD as a whole, about 5% more of the first-term women reenlisted than men, but career men reenlisted at a rate of 15% higher than like women.

2.4 CONCLUSIONS

When the studies are viewed as a whole, several patterns emerge. The gender ratio of a group has no effect on its performance of field duties, although this result is only tested for concentrations of women less than 35%. Both the MAX WAC and REFORGER studies support this view. The Green and Wilson study provides some evidence, however, that the percent female in a training group has a substantial effect on individual performance. If it were possible to generalize the results of this case study, then the integration of women over every organization level would have the most positive effect on overall individual performance and attitudes.

The REFORGER study indicates that the performance of men and women are statistically indistinguishable, and the analysis of Green and Wilson corroborates this finding. The REFORGER and MAX WAC exercises do show, however, that men work longer hours than women. It is impossible to say if there are male-female differences in availability because the statistical results are ambiguous. Although the Service-specific evidence is mixed concerning which sex loses more work time, the data are consistent in showing higher attrition among women and longer careers among males. Finally, the REFORGER study indicates that women are less able to mobilize quickly than men.

Attitudes towards women are hard to summarize because
results of attitudinal surveys are so sensitive to the exac
question asked. There does seem to be, however, a differen
between women as individuals and women as members of a gend
For instance, on the REFORGER exercise, NCO supervisors ten
rate each man and woman equally, but they rated the perform
women as quite inferior to that of men. On the whole, thou
both men and women favor the use of women in the military.

Unfortunately, there are many problems with the exist
literature in that research has been both faulty and incom
As to the former, the applicability of most studies is ham
their (1) limited sample and scope, (2) artificial impleme
and (3) problems with experimental and statistical control
analyses have relied on a small number of observations of
and individuals, with women functioning in only a few occu
Further, many studies did not consider indicators of perfo
and readiness. Even so, the results reported were probabl
indicative of only temporary situations created by the tes
itself. Finally, in most studies, variations in indicator
been blurred by the lack of experimental control for the p
female in the work group and group and individual
characteristics.

These problems suggest the path for further research
obviously, convincing research should draw on a large,
representative sample with a rich set of information on p
and work group characteristics. This would give any find
greater statistical precision because of the increased nu
observations, and because it would allow for better cont
other sources of variation. As yet, nothing is known of
daily, as opposed to test-specific, effects of women and
composition on the performance of work groups. Although
is known about most of the possible problems involved, t

of and the reasons for these problems is unknown. For example, the effect of military couples with dependents on availability and readiness and the effect of increasing the number of women in a group on incidences of work around phenomena have been hypothesized but never fully tested heretofore.

3. SURVEY METHODOLOGY AND DATA COLLECTION

This chapter documents the methodology and data collection activities of the 1984 U.S. Air Force Survey of Work Groups. The design of the survey reflects the Air Force's objective to understand the dynamics of group functioning in general and the role of women in particular.

Instrument development and field activities are discussed in five sections:

- Overview of the survey;
- Data collection instruments;
- Pretest of instruments and procedures;
- Data collection procedures; and
- Coding procedures.

Chapter 4 discusses sample design, selection, and performance.

3.1 OVERVIEW OF THE SURVEY

The Survey of Work Groups focuses on enlisted, active-duty Air Force men and women who serve around the world. A sample of 30 bases (22 in the continental U.S., one in Alaska, and seven overseas) and 14,639 enlisted personnel, an average of 488 from each base, were selected according to the sample plan described in Chapter 4. Over 83% of the initial sample (excluding those who died or left the Air Force) participated in the survey. This sample is the primary source of information for the analysis of the effects of women on work groups and male-female differences in individual performance and commitment.

Substantive focus of questioning. Enlisted personnel were primarily questioned about (1) individual characteristics and behavior, and (2) actual work group conditions and performance in the regular work period immediately preceding administration of the questionnaire. Relatively few questionnaire items asked respondents to report their attitudes about hypothetical situations. Thus, a strength of the study is that its findings and recommendations are grounded in repondents' firsthand reports of current working conditions in work groups, the most basic units that carry out the Air Force's day-to-day functions. Multivariate analysis was used to estimate the relationships between performance and individual or group characteristics.

Data collection procedures. The survey used a combination of data collection methods. Most data were collected using a self-administered questionnaire (hereafter referred to as the "Main Survey Questionnaire") conducted in group settings with trained NORC interview staff to introduce the survey and answer questions. This was supplemented by interviews with a subsample of respondents designed to probe, in more depth, the same topics covered in the Main Survey Questionnaire. Finally, a small proportion of enlisted personnel unable to attend the group sessions responded individually to the same survey used in the group setting.

Other study populations. In addition to the main study population, three other groups were surveyed:

- **Senior Officers** -- Personal interviews with a small purposive sample of senior officers on the bases from which enlisted personnel were sampled supplemented the enlisted sample data. These interviews covered many of the same topics in the Main Survey Questionnaire, and were designed to augment the data from the enlisted with data from more experienced individuals.

- **Enlisted Personnel on GSUs** -- A sample of 1,996 enlisted personnel serving in Geographically Separated Units (GSUs), associated with but physically separate from the main sample bases, was sent the Main Survey Questionnaire, completed it without assistance, and returned it by mail to NORC. GSU data allows examination of the effects of women on work groups in relation to this particular type of assignment.

- **Enlisted Personnel on Korean Case Study Bases** -- Although included in the original population of bases from which the main survey sample was drawn, by chance none of the overseas bases in isolated locations that have tours shorter than average (12 to 15 months) were selected. Separate surveys were administered to 1,038 enlisted personnel from two such bases in South Korea to determine if the effects of women in work groups on these bases is itself affected by the bases' special circumstances.

The senior officers interview analysis is included in this report (see Chapter 10). Data from the other two populations are to be analyzed at a later time.

3.2 DATA COLLECTION INSTRUMENTS

Three kinds of data collection instruments were used in the survey. A self-administered questionnaire was used with enlisted personnel, and separate interview guides were used with subsamples of enlisted personnel and senior officers at each base.

3.2.1 Main Survey Questionnaire

The primary data collection instrument was the self-administered Main Survey Questionnaire. The questionnaire was used in group survey sessions with almost 12,000 enlisted personnel, and was mailed to another 3,000 individuals stationed at GSUs and the Korean case study bases. The questionnaire was constructed for this study and used closed-ended questions and an optically-scanned answer sheet (see Appendix A). Questionnaire items were designed to provide data on the organizational effects of women in the Air Force. Organizational variables are measured at the level of enlisted work unit or work group.

The literature review suggests that the effects of women on their work groups may vary with the nature of the work group's task, the proportion of women in the work group, and other characteristics of the work group. Therefore, one analytic goal was to measure the characteristics of work groups that might interact with the presence of women or independently affect comparative assessments of the functioning of work groups, so that these characteristics could be controlled for in the statistical analysis. Thus, the measurement task was to define the work group to yield an organizationally meaningful grouping within the Air Force, one that would be appropriate to a large variety of work situations but not too broad as to be analytically useless. Furthermore, it had to be unambiguous and easily understood by all survey respondents.

For purposes of this study, the work group is defined as the small group of people with whom the respondent works on a daily basis toward a common objective or mission. Typically, it contains approximately 20 or fewer people who work on the same shift within close physical proximity of each other, have the same functional account code, and report to the same supervisor. However, these conditions are not sufficient to describe all Air Force work groups. Pretesting and discussions with Air Force staff during instrument development showed that five general variants would encompass most work groups. These are described in the opening pages of the questionnaire in Appendix A.

Dependent Variables. The Air Force's primary concern was the effect of women on the performance of work groups. By choosing a survey approach to the research questions, the Air Force chose measures of performance that by definition rely on reported rather than observed behavior. Specifying surrogates for objective indicators of the output variables is probably the most difficult and controversial element of any survey study of performance. The task was further complicated because performance measures would be studied for a wide array of occupational categories -- all those in which Air Force enlisted personnel serve.

The study also sought to measure dependent variables that are not direct work outcomes but can influence work group effectiveness. These include morale, tension related to male-female relations, commitment to remain in the work group or in the Air Force, and availability for temporary duty and deployment.

The final specification of dependent variables was based on reviews of several bodies of literature. Social organizational theory suggested important variables. Studies of performance in various occupational settings (similar to the range of occupations to which survey respondents would be assigned) suggested ways to approach the problem. Studies on military populations suggested approaches to the measurement of morale and organizational cohesion. Research on women in the work place was examined for indicators of successful and unsuccessful integration of women into formerly male-dominated professions (see References).

Independent variables. Much of the same literature was instrumental in developing items to measure independent variables; studies that examined performance outcomes also examined the predictors and correlates of those outcomes. Thus, the social organizational literature revealed factors that affect organizational productivity, efficiency, personnel turnover, and worker satisfaction; "women in the work place" studies suggested structural and attitudinal variables associated with acceptance of women in various occupations and settings, and so on. After the variables of interest had been further defined and specified, instruments from previous studies were reviewed for specific, well-tested items designed to measure these factors (see References).

The questionnaire required approximately one hour to complete. Its 169 items can be arrayed into several general areas:

- Characteristics of the respondent's work group, including type of work group, personnel composition, functional area, working conditions, morale, and quality of supervision;
- Assessments of the work group's quality of work, rate of production, and ability to mobilize;
- Any incidents of "work around" and sexual harassment;
- Opinions on possible consequences to the work groups if the number of women in them were increased to one-half (the only explicitly speculative set of questions for all respondents);
- How the respondent's hours were spent during the previous work week; and
- Basic demographic characteristics.

A separate set of questions also asked supervisors to evaluate the largest group he or she oversees in terms of morale, day-to-day performance, stability, and disciplinary problems. Each was then asked to evaluate the same group characteristics in terms of the current effects of women in the group and the likely effects if the number of women were increased to 50% of the group.

3.2.2 Supplementary Interview Guides

In addition to the Main Survey Questionnaire, two supplementary interview instruments were developed:

- The Interview Guide for Enlisted Personnel was used with a subsample of the enlisted personnel selected to complete the Main Survey Questionnaire. It was designed to provide more detailed coverage of issues and attitudes related to the effect of women on work groups in the Air Force.
- The Interview Guide for Senior Officers was used with two senior officers, usually Wing Commanders or Deputy Commanders for Maintenance, at each of the bases sampled. Its purpose was to examine the same issues examined in the enlisted survey, but from the commanding officer's perspective. The data from these instruments are intended to clarify and expand interpretation of the data gathered by the basic survey instrument.

The Interview Guide for Enlisted Personnel takes about 30 minutes to administer, and uses both closed-and open-ended questions. It asks respondents to supply reasons for some of the multiple choice answers given on the basic survey instrument, and asks for more information about how "work around" problems are handled within the work group (it covers this topic separately for men and women). The interview guide also asks respondents about the possible effects of increasing the proportion of women in the work group. A final open-ended question asks if respondents have anything to add that is not already addressed in the survey. The instrument is reproduced in Appendix B.

The Senior Officers Interview Guide was intended to take about 30 minutes to administer, although the actual interviews often lasted an hour or longer. The officers described the factors or conditions that interfere with operations within the base or wing for which they are responsible. In a sequence of questions similar to that asked of supervisors in the Main Survey Questionnaire, the officers also described the effects of current numbers of women on the work group. The Senior Officers Interview Guide is reproduced in Appendix C.

3.3 PRETEST OF INSTRUMENTS AND PROCEDURES

In mid-September 1984, a pretest of the Main Survey Questionnaire and an early form of the Interview Guide for Enlisted Personnel was administered to approximately 150 individuals at Dover Air Force Base in Delaware. This session allowed NORC to refine its techniques for administering the survey in a group setting, and familiarized NORC staff with general base procedures. A final pretest was administered to approximately 25 enlisted personnel at Brooks Air Force Base in Texas to assess last-minute changes to the questionnaire.

3.3.1 Instruments

The primary purpose of the pretest was to obtain information about the performance of the items that made up the basic study questionnaire -- their clarity and face validity, the adequacy of their response options, the suitability of their placement within the instrument, and the appropriateness of their interconnecting instructions. Also, the pretest would indicate the most effective mix of written explanations and instructions within the questionnaire and oral explanations, instructions, and examples from trained survey session leaders.

This decision was particularly important with respect to explanations of the key concept, "primary work groups". It was essential to the validity of the study that respondents understand and use this term in the manner intended by the researchers, and that the term accurately represent a fundamental unit of organization within the Air Force. Therefore, the adequacy of the explanations of the concept was central to the success of the research.

Going into the pretest, this fact was in conflict with the conventional wisdom that it is poor questionnaire design practice to begin a survey instrument with lengthy written instructions (they are unlikely to be read with anything close to the attention hoped for by their authors). Yet, too great a dependence on trained interviewer explanations would make self-administration of the survey more susceptible to respondent errors in interpretation,[1] which would result in non-comparable data. The pretest gave the researchers an opportunity to refine the key work group concept, obtain the advice of the respondents themselves on appropriate language and examples for describing it, and learn the best means for presenting it.

Two different introductions to the survey and the work group were tested using different combinations of oral and written explanations and examples. Respondents were asked for their reaction to language choice and the adequacy of the response categories (e.g., completeness, mutual exclusivity), and were also asked to report any errors of omission. During the pretest, respondents were asked to note on a separate paper any problems they encountered with questionnaire items, and were encouraged to make observations they believed should be considered before the survey group selected the final version of the questionnaire.

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[1] Some persons could not attend the group survey sessions, or were working at GSUs or case study bases where NORC staff would not be present to administer the study.

Respondents and researchers discussed these topics at the conclusion of the pretesting session.

The pretest revealed more examples of existing work groups that the instrument would have to accommodate, and helped researchers clarify the appropriate combination of written and oral instructions. Discussions indicated problems in the wordin or formatting of several questionnaire items, which were modifie accordingly in the final version of the questionnaire. In accordance with expectations, responses to most items were generally distributed across the entire range of alternatives.

The pretesting of personal interviews with enlisted personn used open-ended questions to elicit reasons behind responses giv in the closed-ended Main Survey Questionnaire. Rather than rely totally on the more difficult to analyze open-ended format, patterns and common themes in the responses, revealed by the pretest, were used to construct closed-ended questions for some the items.

At the time of the pretest, the Special Study Group had not confirmed that interviews with senior officers would be included in the study. Therefore, the Senior Officers Interview Guide ha not been developed and could not be tested during the Dover pretest. The final form of the Senior Officers Interview Guide mostly used tested items from the other two instruments. It was pretested on Air Force Special Study Team officers for clarity a length considerations.

3.3.2 Procedures

Before the researchers arrived at the base, the local Surve Control Officer (SCO) was told the purposes and requirements of the pretest. The SCO scheduled male and female enlisted personnel, representing a variety of work group assignments and ranks, for survey sessions and personal interviews. Four sessions involving a total of 147 individuals were held over two days.

In contrast to the sampling requirements for the full study, the SCO was free to select any readily available individuals who fit the specified criteria for these activities. This group selected by the SCO was handled just as the specified random sample of enlisted personnel was in the main study. The SCO made up alphabetized lists of the individuals scheduled for each session. Respondents were checked in at the sessions by NORC staff. No substitutions were allowed. Individuals who did not appear for their scheduled session were contacted by the SCO and rescheduled whenever possible, and reasons for non-participation were obtained for those who could not reschedule.

The primary purpose of the pretest was to gain information about the instruments. It was not intended to be a full pilot test of all elements of the main study. NORC would use inferences from the pilot study experience and briefings from the Special Study Team staff about conditions likely to be encountered at different types of bases to prepare interviewers for their tasks during the main study.

3.4 DATA COLLECTION PROCEDURES

Assisted by Air Force Survey Control Officers and their staffs on the 30 bases, NORC was responsible for data collection. A Special Study Team officer coordinated base activities and consulted with the NORC project management staff on questions that arose in the course of data collection. The project director for

SRA also consulted on questionnaire issues during the field period.

Eleven NORC interviewing teams conducted group survey sessions and personal interviews from late October to late November, 1984. The teams consisted of a team leader, drawn from the pool of NORC's most experienced permanent interviewing staff (all senior managers within the NORC field staff structure), and two other experienced interviewers. At the request of the Air Force, at least one member of each team was male so that any effects of sex of interviewer on the direction and intensity of responses about women in the personal interview could be measured. NORC's experiment to test for these effects is described in section 3.6.

3.4.1 Scheduling

Field activities began with the scheduling of data collection at the bases selected for the study. Chapter 4 describes the sample design. Scheduling had to await confirmation that no major Air Force activities would conflict with the data collection period. At this time, messages were sent from the Special Study Group to the Base Commanders and Survey Control Officers apprising them of the purpose and scope of the study and the roles they would be required to play in collecting data.

After Air Force approval team leaders called the base SCOs to inform them of the data collection dates. Four days would be required at each base to administer the group survey and conduct interviews with enlisted personnel and senior officers. NORC team leaders sent each SCO a letter that reiterated the plans made over the phone and outlined in detail the activities planned for the survey week and the intermediate actions required of the SCO.

At least two weeks prior to data collection, the Air Force Special Study Team sent SCOs the lists of base personnel to be scheduled for the study. Organized by unit, the lists indicated whether an individual was selected for the group survey only, the survey session plus personal interview, the GSU sample associated with that base. SCOs and the affected officers were notified of the senior officers selected for interviews. NORC also received this information and sent alphabetized lists of the entire base sample to team leaders before they arrived at the base.

3.4.2 Base Procedures: Group Survey Sessions and Follow-up Cases

Teams arrived at the bases the afternoon before the first day of data collection. Team leaders met with SCOs or their representatives to review the team's planned activities and requirements for that week. Four group survey sessions of approximately 40 respondents were scheduled for each of three days. Alphabetized lists of each session's scheduled participants, used to log in the sample members, were prepared by the SCO and given to the NORC team at least half an hour before each session. Because respondents had to complete the Main Survey Questionnaire before being interviewed, those selected for personal interviews were scheduled for group sessions early in the week to maximize the team's flexibility in arranging interview times for them. Whenever possible, an individual's interview was to take place immediately after his or her group survey session. Interviews with the base's senior officers were arranged for early in the week.

Team leaders toured the facilities reserved for the group and interview sessions (a large room with ample writing space for 40, and three private rooms for conducting personal interviews) and made any last-minute requests for necessary materials and assistance.

The management of tasks within the group sessions varied with base conditions. In all cases, however, sessions began by logging in respondents to ensure that those present were on the sample list. There were, in fact, numerous cases of the wrong individuals appearing at the survey session (ascertained by checking the social security number on the original sample list with that of the individual who appeared at the session). SCOs were immediately notified of such problems and asked to call the correct individual and reschedule him or her. Depending on the judgment of the team as to the more appropriate response at the time, the non-sample members were thanked but told they need not stay, or were allowed to stay and complete the questionnaire but had their questionnaires removed after the session.

All sessions began with introductions to the study, a description of NORC and its role in the research, and pledges that the Air Force would never receive information directly linking a name with an individual answer sheet. NORC staff then spent 10 to 15 minutes explaining the work group concept, going through the questionnaire examples of different types of work groups, and answering respondents' questions about classifying their own work groups. After all work group questions were resolved, the group was told to proceed, with each person working alone and questions handled one-on-one, until all had finished the questionnaire.

Latecomers were handled in a variety of ways. Having three members on each team allowed NORC the flexibility of sending one team member to another room to start another session with those who had arrived after the main session was well under way. A few bases did not have the space to accommodate a small, concurrent second session, so latecomers at these bases received individual introductory instructions and were either brought into the main room to complete the survey with the others or rescheduled for another session. The latter was the less preferred and less used option, however, because of the risk of losing the sample member if he or she were not surveyed at that time.

Teams completed a Session Report Form on each session, describing the number of individuals in the session and any administrative problems or questions related to interpretation of the questionnaire. These report forms were also used to summarize respondents' comments about the survey. The report forms were grouped with the answer sheets and mailed to NORC. NORC passed them all to SRA.

NORC team members called the NORC central office if any questions they could not resolve arose during the session. If NORC project managers could not resolve the problem, the Study Team liaison officer or the SRA project director was consulted. All such questions and their answers were documented. If general principles were developed, they were passed back to all teams in the field. The most frequent question of this type concerned the appropriate description of a respondent's functional area (Q.25 in the Main Survey Questionnaire). Functional area is an administrative term not in general use among enlisted personnel, and it was not always apparent from the questionnaire where an individual should be placed. Thus, as areas not on the list were encountered in the field and their appropriate classification determined, they were added to all survey teams' lists for use in subsequent sessions.

As respondents handed in answer sheets, team members scanned them for completeness. If the answer sheet was largely incomplete or sections had been inappropriately skipped, respondents were asked to stay and complete the questionnaire. At the end of each session, the names of scheduled participants who had not shown up were reviewed with the SCO, who was to call the individuals or their supervisors immediately to find out the reason for noncompliance and to reschedule them.

The last day at the base was used to hold make-up group sessions for people who did not attend earlier sessions and for additional personal interviews (see next section). Up to eight extra sessions were conducted during the four days to accommodate respondents' schedules. NORC team members worked an average of 45 hours during the four-day period.

The final day was also used for meeting with the SCO to review the status of all cases on the base and to review the SCO's responsibilities and procedures for following up cases after NORC's departure. It was essential that each case in the original sample be accounted for by name (i.e., be given a disposition code: for example, as a completed case or as a non-respondent because no longer in the Air Force, deceased, for medical reasons, etc.) so that sample weights and error rates could be computed.

NORC's confidentiality agreement with the Air Force precluded the usual procedure of assigning case ID numbers to sample members. Thus the completed questionnaire could not be used to define who had and had not participated. Rather, it was necessary to indicate completed cases on the original sample lists, based on the names checked off of the alphabetized lists at each session, and to review the remaining names with the SCO to attribute a reason for non-participation and to assign a disposition code.

The SCO was to attempt to obtain a completed questionnaire within two weeks from all base personnel in the sample who had not participated in the group sessions. In some cases the SCO knew while NORC was on base that this would be impossible because the person was no longer in the service, had received a permanent change of station, was away for training, or the like. The SCO's job was to confirm which individuals could not respond and to track down the others. He or she would have two weeks to follow up cases, after which additional completed answer sheets were to be sent to NORC. For NORC to assign final case outcome or disposition codes to these follow-up cases, it was necessary to make note, for NORC's temporary records only, of a unique answer sheet number to be given to each follow-up case by the SCO. NORC could then check off cases as completed when individual's answer sheets were sent to NORC and could assign final non-response codes to the remaining names in the sample.

3.4.3 Base Procedures: Interviews with Enlisted Personnel and Senior Officers

A subsample of 37 individuals at each base was selected for personal interviews, which took place after they had completed the Main Survey Questionnaire. For analytic purposes, it was necessary that data from a respondent's personal interview eventually be linked with his or her Main Survey Questionnaire responses. NORC staff recorded the numbers on the answer sheets used by respondents who were to be interviewed. No record of the names associated with these cases was kept after the interview was over.

The team's final data collection responsibility was to interview two senior officers at each base. These interviews lasted from 30 to 90 minutes. Because administration of the personal interviews required trained interviewers, there could be no follow-up of personal interview non-respondents after NORC staff had left the bases.

3.4.4 Geographically Separate Units and Korean Case Study Bases

The Air Force sought information about the effects of women on work groups in settings other than the conventional bases represented in the main study sample. Thus, enlisted personnel serving in Geographically Separate Units (GSUs) affiliated with the sample bases were also selected for participation in this study. Because of their off-base locations, the responses to the Main Survey Questionnaire were gathered by mail. The base SCO delivered the questionnaire to the individuals involved, followed up in any way he or she saw fit, and sent all completed questionnaires to NORC within two weeks. NORC followed up with calls to SCOs when GSU cases were not received within the expected period but played no other active role in this data collection activity.

NORC played an even less direct role in data collection on the two Korean Case Study bases. Because NORC staff did not visit these bases, there was no direct contact between NORC and base SCOs. As with the GSUs, SCOs at these bases delivered and retrieved Main Survey Questionnaires and answer sheets, and sent the completed answer sheets to NORC.

No effort was made to monitor case dispositions in the GSU and Case Study samples. Data from these samples and information on their rates of response will be reported in a future document.

3.5 CODING PROCEDURES

3.5.1 Main Survey Questionnaire

Study participants used a machine-readable answer sheet designed specifically for this study. NORC coding staff reviewed completed answer sheets and prepared them for scanning. Each sheet was checked for physical damage (a creased or torn sheet, for example, might jam the scanning process, so the responses were copied onto clean answer sheets by NORC coders), complete marking of response ovals (lightly marked responses were filled in by coders), zero-filling and right-justifying of numbers, and the respondent's Air Force Specialty Code (AFSC).

Despite the fact that the question asked for the numerical AFSC, some respondents used alphabetic symbols, usually in the last field of the five-digit code. A NORC staff member, expert in military coding procedure, recoded these cases by inferring the missing number from other information in the questionnaire, e.g., rank and length of service. All such inferences were documented by answer sheet number. When available evidence did not allow a clear determination of the appropriate code number, the item was left blank and the scanner inserted a star (*), which designated missing data, into the field.

Each answer sheet was given a unique five-digit number, starting with 00001. Five hundred answer sheets were used for the main study at each base (group survey administration plus follow-ups). Each base, then, had answer sheets in a unique sequence -- Base 1 may have received sheets 00001-00499; Base 2, sheets 00500-00999; and so on. After they had been reviewed by coders, the answer sheets were batched by base and sent to the scanner, where base IDs were assigned to each case according to the NORC batch instructions. A similar process was used to assign base IDs to GSU and Korean cases.

In collaboration with the SRA project director, NORC devised item-by-item programming specifications for the scanning subcontractor, Intran Corporation. The specifications describe the legitimate value ranges for each variable and the appropriate ways to code various forms of missing data (e.g., legitimate vs. illegitimate skips) and multiple gridding (i.e., multiple responses to items calling for a single response only). These specifications are available to all users of the data from this study.

3.5.2 Interviews With Enlisted Personnel

The Interview Guide for Enlisted Personnel contained 11 open-ended questions. Discrete response categories were created for these items so that answers could be coded for analysis. To do so, three to four completed questionnaires were selected from each of the first 15 bases from which data had been received at NORC central offices -- 50 questionnaires in all. The responses to each item were transcribed verbatim, then reviewed by the NORC and SRA project directors for themes and patterns that could stand as response categories. A tentative list of coding categories was proposed and tested for usefulness with another set of 50 questionnaires. A final list was agreed upon, and two experienced coders were trained in its application. The NORC project director re-coded the first 75 cases of each coder to provide instructional feedback and to refine the guidelines for the use of any particular category. Inter-coder reliability was assessed using the remaining 651 cases. Each coder recoded 15% of the work of the other, blind to the original coding decision. Inter-coder reliability was a very strong 93%.

After open-ended items were coded, closed-ended items were prepared for data entry. The same conventions for missing data were used in this questionnaire as with the Main Survey Questionnaire. Data entry was 100% verified, and had an entry error rate of less than 0.1%.

3.5.3 Interviews With Senior Officers

The 60 completed Senior Officers Interview Guide instruments were sent directly to SRA for analysis, with no processing by NORC. SRA staff followed the same procedures that were used for the Interview Guide for Enlisted Personnel to define response categories for the officers' open-ended questions.

3.6 INTERVIEWER BIAS: EXPERIMENTAL FINDINGS

During the design phase of the study, Air Force representatives were concerned that male respondents interviewed by female interviewers might feel less free to express their true attitudes about women in the Air Force than if they were interviewed by males or vice versa (i.e., male interviewer-female interviewee). The concern being that sex of interviewer and interviewee in various combinations might affect responses. NORC systematically tested for this possibility by conducting an experiment in the course of data collection.

The Air Force's concern was reasonable. It is plausible to speculate that if an enlisted man has negative feelings about women in the Air Force, he may soften or mute his expression of these feelings rather than offend a female interviewer. Alternately, the mere presence of a women may serve as a cue that anti-female sentiments are socially unacceptable.

On the other hand, the fundamental model on which most survey interviewing is based assumes that the interviewer functions as a neutral stimulus with respect to the topics covered in the interview. This is because survey research is based on a stimulus-response theory of cognition and behavior -- it is assumed that a questionnaire item will mean exactly the same thing to every respondent. Hence, the interviewer serves as a conveyor and clarifier of question content and recorder of responses, but does nothing to affect the direction or intensity of responses given by the respondent.

For this survey effort, all data collection staff had received NORC's required general (i.e., not project-specific) training. Many had served as instructors for this training as well. General training established the principles of good interviewing that hold true across all survey studies. These principles include maintaining a professional demeanor and obvious neutrality with respect to all questionnaire topics; adherence to questionnaire instructions; no deviation from questionnaire text; use of only standard or specially prescribed probes; and responding to interviewee questions with simple repetition of the items or other prepared neutral responses. In addition, all team members received training specifically designed for the Air Force study.

While considerable research has examined response effects of interviewer characteristics (e.g., Sudman and Bradburn, 1974; Singer et al., 1983), there have been relatively few systematic examinations of the effects of interviewer sex. Benney et al. (1956) found male interviewers less likely than females to receive reports of sex habits as a possible cause of mental disturbances. Kindel (1961) found that wives report exerting more influence on family decisions when reporting to female than to male interviewers. Psychological literature on self-disclosure shows females generally to be more self-disclosing (e.g., Lombardo and Berzonsky, 1979), and both sexes to disclose more in the presence of a same-sex model or interviewer (Casciani, 1978). In an analysis of data collected by telephone interviewers at NORC, Nealon (1983) reported significant differences in the responses obtained by male and female interviewers in interviews with farmers and their wives.

Other research has reported no effect of sex of interviewer. Colombotos et al. (1969; cited in Nealon, 1983) found essentially no difference in the reporting of psychiatric symptoms to male and female interviewers. Dillman et al. (1976) did not examine the content of responses, but showed in their research that telephone interview refusal rates for male and female interviewers were virtually the same.

In summary, the current literature shows that under varying circumstances the sex of the interviewer can influence the data. The survey experiment reported below was designed to reveal whether the sex of highly skilled and experienced interviewers can affect responses to a personal interview survey when the subject matter deals explicitly with sex-related issues.

3.6.1 Design of the Experiment

Thirty-seven people were selected from each base's main survey sample for personal interviews, 1,110 individuals in all. The ratios of males to females selected for personal interviews on any particular base ranged from 33:4 to 24:13, but was typicall 30:7.

The following assignment table determined interviewing assignments for the study in a way that would maximize the numb of cross-sex interviews, but minimize between-cell differences.

		Sex of Respondent		
		Male	**Female**	**Total**
Sex of Interviewer	**Male**	442(39.8%)	113(10.2%)	555 (50.0%)
	Female	442(39.8%)	113(10.2%)	555 (50.0%)
	Total	884(79.6%)	226(20.4%)	1110(100.0%)

ORIGINAL ASSIGNMENT

The appropriate number of interviews in each cell was specified to the teams at each base, in accord with the actual numbers of male and female respondents selected on the base.

The survey teams implemented the study design, as shown in the table below.

		Sex of Respondent		
		Male	**Female**	**Total**
Sex of Interviewer	Male	321(40.1%)	86(10.7%)	407 (50.8%)
	Female	312(39.0%)	82(10.2%)	394 (49.2%)
	Total	633(79.1%)	168(20.9%)	801(100.0%)

COMPLETED ASSIGNMENT

The interview guide used a reiteration of responses to the group survey as the starting point for further questioning. Thus, several times respondents were asked to report their responses to the group survey, and were then questioned about their reasons for those responses or asked to elaborate upon them. For example, if they said in the main survey that they would like to transfer out of their present work group, during the interview they were asked the main reason for wanting to do so. They were also asked "What is it specifically about (THE MAIN REASON) that would make you want to transfer?" Similarly, those who reported that they would prefer to remain in their present work group were asked, "What is it about your work group that makes you want to stay rather than transfer?"

In our analyses, we would expect to find no difference in responses by sex of interviewer for questions that were simply reports of responses given previously in the group survey session, because there was no interviewer involved in the group sessions. However, we might expect to find differences in the interview elaborations upon previous responses, especially those related to gender.

The remainder of the items were original to the interview, so all could be examined for differences in response patterns by sex of interviewer. These items asked whether and at what point increasing the number of women in the work group would positively or negatively affect day-to-day performance and mobility, and the reasons for the responses. They also asked respondents to list the most important positive and negative things that might happen if the number of women in the work group were increased substantially in the next couple of years.

The responses of males and females were examined separately. Responses given to male interviewers were compared with those given to females for both male and female respondents. The chi square statistic was computed to describe any differences in the pattern of responses across a variable's response categories obtained by male and female interviewers.

3.6.2 Findings

In many cases, particularly with the female respondent sample which totaled 168 individuals, cell sizes are too small to compute the chi square (i.e., more than 1/5 of the expected frequencies are less than 5 when df = 1; see Cochran, 1954).[1] In these cases the pattern of responses was examined for trends. Because of the very small number of women interviewed, however, a great deal of caution must be exercised even in the discussion of trends. There are simply too few cases to allow confident argument about the overall effects of sex of interviewer on the responses of female enlisted personnel. To remind the reader of the small female sample size, numbers of cases in each response category are reported in addition to percentages.

No statistically significant differences in survey responses by sex of interviewer were found for questions that met the assumptions of the chi square. Nor do the patterns of responses on the other variables indicate systematic variation with the sex of the interviewer.

In the questions repeated from the Main Survey Questionnaire, no differences were found where none were expected. Table 3-1 shows this for three central "repeat" questions.

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[1] "df" equals degrees of freedom.

TABLE 3-1

RESPONSES TO QUESTIONS REPEATED FROM THE MAIN SURVEY QUESTIONNAIRE, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

Question	Male Respondent		Female Respondent	
	Male Int.	Female Int.	Male Int.	Female Int.
1. Would you transfer from your current work group if you could?				
Yes	26.8	31.4	37.2	31.7
No	73.2	68.6	62.8	68.3
Total Number	321	312	86	82
	Chi Sq$_1$df=1.42 p<.23		Chi Sq$_1$df=.33 p<.56	
2. Did you report that your work group had a problem with any men not carrying their own weight?				
Yes	42.4	45.8	44.2	50.0
No	89.1	85.2	80.2	74.4
Total Number	321	312	86	82
	Chi Sq$_1$df=.64 p<.43		Chi Sq$_1$df=.36 p<.55	
3. Did you report that your work group had a problem with any women not carrying their own weight?				
Yes	10.9	14.8	19.8	25.6
No	98.1	85.2	80.2	74.4
Total Number	321	311	86	82
	Chi Sq$_1$df=1.80 p<.18		Chi Sq$_1$df=.52 P<.47	

As shown in Table 3-2, respondents' answers to the questions original to the interview showed no systematic variation by the sex of the interviewer, where variations might logically occur. On only one item was a statistically significant difference in responses found: male respondents were somewhat more likely to tell a male than a female interviewer that increasing the number of women in their work group would have no positive consequences. Statistically significant differences could not be found for any of the other questions for which the chi square could be reliably computed.

These findings indicate that the Air Force need not exercise any special caution related to a sex of interviewer/sex of respondent interaction in interpreting the findings from the personal interviews. They also argue for the efficacy of NORC training in producing interviewers who function as neutral stimuli in the interview session.

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
1. (If you **would** transfer from your work group) What was the **main** reason for this?				
Supervisor	14.0% 12	13.1% 13	6.3% 2	26.9% 7
Co-workers	3.5 3	2.0 2	15.6 5	11.5 3
Duties, tasks	46.5 40	36.4 36	40.6 13	23.1 6
Physical conditions	1.2 1	2.0 2	0.0 0	0.0 0
Location	1.2 1	1.0 1	0.0 0	0.0 0
Hours/shift	9.3 8	15.2 15	9.4 3	11.5 3
Other reason	24.4 21	30.3 30	28.1 9	26.9 7
Total Number	86	99	32	26

(Expected values of cells too small to meet the assumptions of the Chi Square.)

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
2. How much is (men not carrying their own weight) a problem in getting the work done in your work group?				
Very serious problem	3.0 4	2.1 3	2.6 1	9.8 4
Serious problem	6.7 9	12.6 18	10.3 4	12.2 5
Moderate problem	34.1 46	32.2 46	30.8 12	36.6 15
Slight problem	45.9 62	42.0 60	51.3 20	29.3 12
No problem at all	10.4 14	11.2 16	5.1 2	12.2 5
Total number	135	143	39	41
	Chi Sq._{4df}=3.08 p<.54		(Cells too small for Chi Sq.)	

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
3. How much is (women not carrying their own weight) a problem in getting the work done in your work group?				
Very serious problem	8.1 3	2.0 1	12.5 2	9.5 2
Serious problem	21.6 8	24.5 12	6.3 1	14.3 3
Moderate problem	21.6 8	32.7 16	18.8 3	28.6 6
Slight problem	37.8 14	26.6 14	31.3 5	38.1 8
No problem at all	10.8 4	12.2 6	31.3 5	9.5 2
Total number	37	49	16	21
	Chi Sq.4df=3.26 p<.52		(Cells too small for Chi Sq.)	

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

Question	Male Respondent		Female Respondent	
	Male Int.	Female Int.	Male Int.	Female Int.
4. If the female percentage of your work group were increased from its present level, is there any point at which percentage of women would begin to have an effect on the group's day-to-day performance?				
Yes, a positive effect	5.9 19	8.0 25	12.8 11	9.8 8
Yes, a negative effect	34.9 112	31.7 99	17.4 15	9.8 8
No effect	59.2 190	60.3 188	69.8 60	80.5 66
Total number	321	312	86	82
	Chi Sq.$_{2df}$=1.50 p<.47		Chi Sq.$_{2df}$=2.80 p<.25	
5. If the female percentage of your work group were increased from its present level, is there any point at which the percentage of women would begin to have an effect on the group's ability to mobilize quickly?				
Yes, a positive effect	1.6 5	3.2 10	0.0 0	3.7 3
Yes, a negative effect	25.3 81	23.8 74	16.3 14	17.1 14
No effect	73.1 234	73.0 227	83.7 72	79.3 65
Total number	320	311	86	82
	Chi Sq.$_{2df}$=2.0 p<.38		(Cells too small for Chi Sq.)	

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

Question	Male Respondent		Female Respondent	
	Male Int.	Female Int.	Male Int.	Female Int.
6. If the number of women in your work group were increased substantially over the next couple of years, what are the most important positive things that would happen in your work group?				
No positive consequences	48.1 154	38.1 119	31.8 27	39.0 32
Morale improvement	10.9 35	13.5 42	2.4 2	4.9 4
Productivity increase	3.8 12	8.7 27	14.1 12	7.3 6
Improve work quality	8.4 27	9.9 31	12.9 11	19.5 16
Workload decrease	3.1 10	2.6 8	1.2 1	0.0 0
Better atmosphere	21.3 68	19.9 62	23.5 20	13.4 11
Less verbal or sexual harassment	0.0 0	0.6 1	4.7 4	2.4 2
Improve discipline	0.6 2	0.0 0	0.0 0	0.0 0
Other	3.8 12	6.7 21	9.4 8	13.4 11
Total number	320	312	85	82

Chi Sq.8df=18.0 p<.02 (Cells too small for Chi Sq.)

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
7. If the number of women in your work group were increased substantially over the next couple of years, what are the most important negative things that would happen in your group?				
No negative consequences	32.3 103	28.8 90	37.2 32	36.6 30
Moral decline	1.9 6	1.9 6	2.3 2	0.0 0
Productivity decline	10.3 33	9.0 28	7.0 6	2.4 2
Quality decline	1.3 4	2.2 7	1.2 1	2.4 2
Workload increase	2.8 9	2.9 9	1.2 1	0.0 0
Less pleasant atmosphere	10.0 32	9.6 30	20.9 18	17.1 14
More verbal or sexual harassment	3.1 10	6.4 20	2.3 2	1.2 1
Less group strength	12.2 39	12.8 40	5.8 5	13.4 11
Interference of "female problems", pregnancy	7.8 25	8.7 27	8.1 7	14.6 12
Interference of family care demands	0.9 3	1.9 6	1.2 1	2.4 2

(continued)

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
Women would be a distraction	4.1 13	4.2 13	4.7 4	0.0 0
Higher turnover	2.5 8	1.0 3	2.3 2	3.7 3
Less combat effectiveness	2.2 7	1.9 6	1.2 1	1.2 1
Other	8.5 27	8.7 27	4.7 4	4.9 4
Total number	319	312	86	82
	Chi Sq.13df=8.86 p<.78		(Cells too small for Chi Sq.)	

TABLE 3-2

RESPONSES TO QUESTIONS ORIGINAL TO THE INTERVIEW, BY SEX OF INTERVIEWER AND SEX OF RESPONDENT

	Male Respondent		Female Respondent	
Question	Male Int.	Female Int.	Male Int.	Female Int.
8. Is there anything else that the Air Force should consider in its decision about the appropriate number of women in the service?				
No, nothing to add	40.5 130	41.3 129	51.2 44	43.9 36
Sex should not be considered an issue	2.8 9	7.7 24	3.5 3	2.4 2
Comment re: women's role in AF	28.3 91	22.1 69	17.4 15	22.0 18
Comment re: family, pregnancy issues	3.1 1	4.5 3	7.0 0	7.3 0
Comment re: work group relationships	0.3 1	1.0 3	0.0 0	0.0 0
Comment re: job conditions	2.5 8	2.9 9	2.3 2	3.7 3
Comment re: training, education	2.2 7	2.6 8	3.5 3	3.7 3
Comment re: living conditions,regulations	10.3 33	10.6 33	4.7 4	11.0 9
Comment re: pay and benefits	1.9 6	2.2 7	2.3 2	0.0 0
Comment re: supervisors	1.6 5	1.0 3	2.3 2	0.0 0
Comment re: questionnaire	4.0 13	1.0 10	3.5 2	3.7 2
Other comment	2.5 8	1.0 3	3.5 3	3.7 3
Total number	321	312	86	82
	Chi Sq.$_{11df}$=14.8 p<.19		(Cells too small for Chi Sq.)	

4. SAMPLE DESIGN, SELECTION, AND PERFORMANCE

This chapter discusses the sampling plan used to draw the sample of enlisted respondents for the Main Survey Questionnaire and the subsample of enlisted respondents for the personal interview. Section 4.2 describes the survey results in terms of response rates and comparative distributions across selected characteristics.

The ultimate goal of most sample selection processes is to select a subset of elements from a larger population in a way that allows conclusions obtained from the sample to be projected, in a valid way, to the entire population. In practice, this goal may be accomplished by using a method of selection known as probability sampling. When probability sampling is used, each element included in the entire population receives a known, non-zero chance or probability of being selected into the final sample. In contrast with other methods of sample selection, probability sampling ensures that the representativeness of the sample will depend upon objective statistical theory, rather than the "judgment" of any single individual or group of experts.

4.1 OVERVIEW

The sample of enlisted Air Force members who participated in this survey was selected using a two-stage, stratified probability selection procedure. In stage one, probability selection was used to designate a stratified sample of 30 (out of a total of 120) Air Force bases around the world. Within each of these selected bases, probability selection was then used to designate approximately 490 individuals for participation in the survey. In total, this produced a probability sample of 14,639 individuals.

At both the first and second stages of selection, strict random probability sampling methods were employed. These procedures assured that each individual in the defined populati had a known, non-zero probability or chance of falling into the sample. As described below, the particular methods employed in this sample selection further ensured that this probability of selection was equal among all males and equal among all females.

Although participation in the survey was voluntary, more t 83% of all individuals who were selected into the sample cooperated and provided usable data. This level of response is well within commonly accepted standards for high-quality survey research. To preserve the integrity of the sample, there were substitutes for initially selected sample individuals who did n participate in the survey.

The population covered in this study was defined as all enlisted persons who were members of the U.S. Air Force as of August, 1984, and were:

- Assigned to bases with at least 100 individuals;
- Not students;
- Not assigned to "Geographically Separated Units" (GSUs) and
- Not assigned to activities outside the Department of th Air Force.

4.2 SAMPLE SELECTION: GENERAL DESCRIPTION

To maximize sample reliability within general guidelines imposed by time, cost, and feasibility, the following general sample design criteria were established:

1. The sample of individuals would be distributed among 30 of the 120 worldwide Air Force bases;

2. The number of sample respondents selected at each base would be approximately equal; and

3. Females would be sampled with probabilities exactly twice those used for males. Within each sex, all individuals in the enlisted population would be given exactly the same probability of sample selection.

These three sample design criteria were satisfied by making use of a stratified two-stage sample design. In the first stage of sampling, 30 out of a total of 120 active Air Force bases were selected on a probability basis. To equalize the data collection workload at each selected base (criterion 2) while maintaining an overall probability selection rate of "f" for males and "2f" for females (criterion 3), the first stage selection of bases was carried out by a procedure known as probability proportional to size (PPS) sampling. In this case, the size measure used for each base was equal to the number of enlisted males plus twice the number of enlisted females. Symbolically, it may be expressed as follows:

Let M_i = the number of male enlisted persons assigned to the i^{th} base.

F_i = the number of female enlisted persons assigned to the i^{th} base.

The first-stage probability of selection (P_1) for the i^{th} base is

$$P_{1i} = \frac{a\ (M_i + 2F_i)}{\Sigma\ (M_i + 2F_i)}$$

where a is a constant equal to 30.

Within selected bases, the selection of individuals was carried out with the following second stage probabilities (P_2) for males and females.

$$\text{MALES:} \qquad P_{2Mi} = \frac{b}{(M_i + 2F_i)}$$

$$\text{FEMALES:} \qquad P_{2Fi} = \frac{2b}{(M_i + 2F_i)}$$

Note that "b" is a constant equal to 488.

As a result of these two stages of sampling, the probability of selection for all males is:

$$\begin{aligned} P_M &= P_{1i} \times P_{2M} \\ &= \frac{a\ (M_i + 2F_i)}{\sum_i (M_i + 2F_i)} \times \frac{b}{(M_i + 2F_i)} \\ &= \frac{a \times b}{\sum_i (M_i + 2F_i)} \end{aligned}$$

The corresponding probability of selection for all females is:

$$P_F = P_{1i} \times P_{2F}$$

$$= \frac{a \; (M_i + 2F_i)}{\sum_i (M_i + 2F_i)} \times \frac{2b}{(M_i + 2F_i)}$$

$$= \frac{a \times 2\,b}{\sum_i (M_i + 2F_i)}$$

4.3 IMPLEMENTATION AND STRATIFICATION

4.3.1 First-Stage Sampling

Within the framework of the probability sampling procedure described above, it was possible to improve the reliability of the sample by imposing "proportionate stratification" on the first-stage sample selection process of bases. Ten first-stage strata were developed on the basis of geography (state within the U.S. and country-continent outside the U.S.). A description of these strata is found in Table 4-1. The 120 bases that met the requirements for inclusion in the population were then sorted on the basis of this geographic stratification system. Within these 10 major strata, further substratification was achieved by ordering the bases by size.

After application of the sort ordering described above, systematic selection was used to give each of the bases its appropriate probability of selection and to actually select the 30 sample bases.

TABLE 4-1

FIRST STAGE: GEOGRAPHIC STRATIFICATION

Stratum	Description/Definition*	Number of Bases
Northwest	WA, OR, ID, MT, WY	5
Northcentral	ND, SD, NE, IA, WI, IL, MI, IN	9
Northeast	KY, OH, WV, PA, DE, NY, VT, ME, MA, RI, MD, DC	13
Southeast	TN, NC, SC, AL, MS, GA, FL	17
Southcentral	KS, MO, OK, AR, TX, LA	20
Southwest	CO, NM, AZ, UT, NV, CA	22
Alaska, Hawaii, Canal Zone		4
Pacific	Asia, Guam, Phillipines	7
Europe, Greece, Turkey		17
U. K.	England	6

*Only states with Air Force bases are included.

The sample bases that were selected in each of the geographic strata are shown in Table 4-2.

TABLE 4-2

NUMBER OF FIRST-STAGE SELECTIONS (BASES) BY STRATA

Stratum	Base Name	Number of Bases
Northwest	Fairchild	1
Northcentral	KI Sawyer, Minot, Offut	3
Northeast	Loring, McGuire, Langley	3
Southeast	Myrtle Beach, Pope, Seymour Johnson, Keesler	4
Southcentral	Reese, McConnell, Carswell, Barksdale, Tinker	5
Southwest	Lowry, Edwards, Norton, Luke, Holloman, Nellis	6
Alaska,Hawaii Canal Zone	Elmendorf	1
Pacific	Anderson, Clark	2
Europe,Greece Turkey	Hahn, Rhein-Main, San Vito	3
U. K.	Alconbury, Lakenheath	2

4.3.2 Second-Stage Sampling

As described above, within each selected base, individuals were selected using the following probabilities.

$$\text{MALES:} \quad P_{2Mi} = \frac{b}{(M_i + 2F_i)}$$

$$\text{FEMALES:} \quad P_{2Fi} = \frac{2b}{(M_i + 2F_i)}$$

The constant "b" is equal to 488.

This probability sub-sampling within base was carried out by Lt. Colonel Michael W. Simmons, USAF, in consultation with Dr. Martin Frankel, NORC's technical director. To improve sample reliability, the second stage of sampling employed stratification of personnel by functional account code. Within each base, two second-stage sampling lists were constructed: one for males and one for females. Individuals on these lists were ordered by functional account code before sample selection. The required probabilities of selection were applied separately to the lists of males and females, using systematic random selection.

The use of geographic stratification at the first stage of selection and the use of functional account code by sex stratification at the second stage of selection ensured that the sample distributions for these variables would closely mirror the distributions found in the total population. Tables 4-3 to 4-5 show the distribution of the individuals in the entire population and in the sample by gender, geography, and functional account code classification. Since females were sampled at a rate twice that of males, all distributions in these tables (except for the distributions of total males and females) are shown separately by sex. Inspection of Tables 4-3 to 4-5 demonstrate that we were successful in maintaining a close agreement between the sample and the population with respect to both geographic distribution and functional account code.

TABLE 4-3

COMPARISON OF SAMPLE AND POPULATION DISTRIBUTIONS: GENDER

Sex	Sample Distribution	Adjusted (Weighted) Sample Distribution	Population Distribution
Males	79.3% (9,353)	89.6%	88.6% (351,777)
Females	20.7% (2,440)	10.4%	11.4% (45,364)
TOTAL	100.0% (11,793)	100.0%	100.0% (397,141)

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TABLE 4-4

COMPARISON OF SAMPLE AND POPULATION DISTRIBUTIONS: FUNCTIONAL AREA*

Functional Area	Males Population	Males Sample	Females Population	Females Sample
Civil Engineering	7.3%	6.9%	3.4%	3.4%
Comptroller	2.0	1.9	4.8	4.8
Depot Ops. & Maint.	0.5	0.2	0.4	0.1
Grd.Comm., Elec.Ops. & Maint.	8.8	7.5	9.0	7.2
Intelligence	1.8	2.4	3.2	5.7
Medical	4.6	4.3	13.1	12.7
Operations-Flight	5.8	6.5	6.2	6.6
Manpower & Personnel	2.6	2.0	6.9	6.0
Research & Development	0.5	0.4	0.6	0.4
Security Police	9.5	9.2	3.3	3.2
Suppy, Services & Contracting	8.2	8.4	13.7	14.0
Training	3.0	3.4	2.9	3.2
Transportation	4.4	4.5	4.6	4.6
Weapons Sys. Maint.	37.1	39.1	20.4	21.2
Admin.,Command,& Other	3.9	3.3	7.0	7.5

*May not equal 100% because of rounding.

TABLE 4-5

COMPARISON OF SAMPLE AND POPULATION DISTRIBUTIONS: GEOGRAPHIC REGION*

	Males		Females	
Region	Population	Sample	Population	Sample
Northern Tier (NW & NC)	15.5%	13.9%	12.8%	13.1%
Northeast	10.1	9.4	10.0	10.1
Southeast	14.3	12.2	14.3	14.2
Southcentral	15.0	15.9	15.0	18.1
South West and Alaska Hawaii, Canal Zone	24.0	24.9	25.2	23.4
Pacific	7.9	5.5	7.0	6.5
Europe, Greece, Turkey	9.5	12.0	11.5	8.5
United Kingdom	4.7	6.2	4.4	6.2

*May not equal 100% because of rounding.

4.4 SAMPLE WEIGHTING

The purpose of sample weighting is twofold. First, sample weighting is used to compensate for differentials in selection probabilities that are introduced as an integral part of the sample design. Sample weighting which compensates for these differentials is considered mandatory when these differentials are present. The second purpose of sample weighting is to compensate for distributional differences between sample and population that either arise by chance or are a result of systematic non-participation patterns. Weighting to accomplish this second purpose is not mandatory, but rather depends on the magnitude of the differences between the sample and population distributions.

The sample design used in the present study specified that females were to be sampled at twice the rate of males. Thus, for all tabulations that combine both males and females, it is necessary to apply a relative weight of one-half to females.

In addition to the weighting imposed to compensate for differentials in probability of selection, the sample has been weighted to conform to known distributions of enlisted persons on the basis of sex and geographic strata. This was accomplished as follows:

Let W_{iP} = the probability compensation weight for the i^{th} sample respondent (i.e., 1 for male; 2 for female)

S_{jk} = the weighted sum of sample respondents within the jk^{th} geographic by sex category (i.e., 20 categories in total, 10 geography by two sex)

P_{jk} = the corresponding population total number of individuals in the jk^{th} geographic by sex category.

The final weight for the i^{th} sample individual is determined as:

$$W_{iFINAL} = W_{iP} \times \frac{P_{jk}}{S_{jk}}$$

4.5 SELECTION OF THE SAMPLE FOR PERSONAL INTERVIEWS

A systematic sample of 37 names was taken from the selections from each base. The selection was carried out on the ordered list (sex by functional account code) that had resulted from the basic within-base selection.

4.6 SURVEY PERFORMANCE

The study's coverage of the eligible sample members was very good. Excellent cooperation was obtained from all bases, despite competing base circumstances ranging from a typhoon, to a massive fire, to various emergency military alerts. The cooperation from individuals was also excellent. Fewer than 1% of those selected actively refused to participate in the study. Fully 100% of the senior officers selected to be interviewed cooperated with the study. The response rates reported in this section describe the sample coverage for the Main Survey Questionnaire and the interviews with enlisted personnel.

Response rates contain information important to the interpretation of two key aspects of survey performance. They provide an indication of the potential for non-response bias in survey data, and they allow the assessment of the quality of a study's operational effectiveness, i.e., its data collection efforts. The term "response rate" can be applied to a number of different performance indicators. This study reports two, which we term the Coverage Rate and the Operational Recovery Rate. The **Coverage Rate**, the more sweeping of the two, denotes the rate at which completed cases were obtained from individuals in the sample who were identified as eligible for the study at the time of data collection. In this case "eligible" is defined as all initial sample members, less those deceased or otherwise no longer in the Air Force. This is the group of inferential interest for this study.

$$\text{Coverage Rate} = \frac{\text{Completed Cases}}{\text{Initial Sample} - (\text{Deceased or left AF})}$$

As shown in Table 4-6, the Coverage Rate for the main survey sample was 83.4%.

The **Operational Recovery Rate** describes the study's operational effectiveness. It denotes the rate at which completed cases were obtained from individuals in the sample who could be considered available during the survey period. Sample members "not available" were those who, at the time of data collection, were deceased or no longer in the Air Force, had received a Permanent Change of Station (PCS) to another base since the sample was drawn, or were in jail or AWOL.

$$\text{Operational Recovery Rate} = \frac{\text{Completed Cases}}{\text{Initial Sample} - (\text{deceased or left AF} + \text{PSC move} + \text{in jail or AWOL})}$$

The Operational Recovery Rate for the main survey sample was 88.2%.

TABLE 4-6

DISPOSITIONS OF CASES IN THE MAIN SURVEY SAMPLE AND ENLISTED PERSONNEL INTERVIEW SAMPLE

Disposition	Main Survey	Enlisted Interviews
Initial Sample	14,639	1,110
Respondent Deceased or left Air Force	437	35
Net Sample for Coverage Rate (Coverage Net)	14,202	1,075
PCS move for Respondent	744	63
Respondent in jail or AWOL	19	2
Net Sample for Operational Recovery Rate (Operational Net)	13,539	1,010
Completed cases	11,775	801
Eligibility Rate (Coverage Net/Initial Sample)...........	97.0%	96.8%
Availability Rate (Operational Net/Initial Sample)........	91.8%	91.0%
Coverage Response Rate (Completed Cases/Coverage Net)..........	83.4%	74.5%*
Operational Recovery Rate (Completed Cases/Operational Net).......	88.2%	77.4%*
Other reasons for non-response		
Medical reasons	48	2
Temporary Duty Assignment (TDY) away from base	571	61
On vacation	288	39
Mission necessity	105	12
Away for training	42	5
Refusal	99	2
Reason unknown	511	89

*No follow-up of enlisted personnel interviews was possible because they required trained interviewers for their administration. Therefore, completion rates for personal interviews are somewhat lower than for the main survey.

Tables 4-7 to 4-9 describe the distribution of males and females in the Main Survey Questionnaire across paygrade, functional area, and geographic region. Comparison with the initial sample characteristics provides strong evidence that non-response to the survey was not systematically related to the above characteristics. Hence, non-response bias appears to be minimal.

TABLE 4-7

PAY GRADE OF MAIN SURVEY SAMPLE RESPONDENTS AND INITIAL SAMPLE MEMBERS*

	Males		Females		Total	
Pay Grade	Obtained Sample	Initial Sample	Obtained Sample	Initial Sample	Obtained Sample	Initial Sample
E-1	1.1	1.0	0.5	0.4	1.5	1.4**
E-2	4.3	3.9	1.2	1.0	5.5	5.0
E-3	22.4	22.1	7.1	6.8	29.5	28.9
E-4	15.3	16.4	6.0	6.3	21.4	22.7
E-5	17.7	17.7	5.0	4.9	22.7	22.6
E-6	9.8	9.8	0.9	0.9	10.7	10.7
E-7	6.3	6.3	0.1	0.1	6.5	6.4
E-8	1.5	1.5	***	***	1.5	1.6
E-9	0.7	0.8	***	***	0.7	0.8
TOTAL: Number	9335	11661	2440	2978	11775	14639
Percent	79.3	79.7	20.7	20.3	100.0	100.0

*Percentages are based on the total number of males and females in each sample, not on the within-sex totals.
**May not total 100% because of rounding.
***Less than .1%.

TABLE 4-8

FUNCTIONAL AREA OF MAIN SURVEY SAMPLE RESPONDENTS AND INITIAL SAMPLE MEMBERS*

Functional Area	Males Obtained Sample	Males Initial Sample	Females Obtained Sample	Females Initial Sample	Total Obtained Sample	Total Initial Sample
Civil Engineering	5.6**	5.5	0.7	0.7	6.3	6.3
Comptroller	1.5	1.6	1.1	1.0	2.6	2.5
Depot Ops. & Maint.	0.2	0.2	0.0	0.0	0.2	0.2
Grd.Comm.,Elec. Ops. & Maint.	5.7	6.0	1.4	1.5	7.1	7.4
Intelligence	1.9	1.9	1.1	1.2	2.9	3.1
Medical	3.5	3.4	2.7	2.6	6.2	6.0
Operations-Flight	4.9	5.2	1.4	1.3	6.3	6.5
Manpower & Personnel	1.7	1.6	1.4	1.2	3.0	2.8
Research & Development	0.3	0.4	0.1	0.1	0.4	0.4
Security Police	7.0	7.3	0.6	0.6	7.6	8.0
Supply, Services & Contracting	6.7	6.7	3.0	2.8	9.8	9.5
Training	2.8	2.7	0.7	0.6	3.4	3.4
Transportation	3.6	3.6	0.9	0.9	4.5	4.5
Weapons Sys. Maint.	31.2	31.1	4.3	4.3	35.5	35.4
Admin., Command, & Other	2.7	2.6	1.5	1.4	4.2	4.1

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*Percentages are based on the total number of males and females in each sample, not on the within-sex totals.

**May not equal 100% because of rounding.

TABLE 4-9

GEOGRAPHIC DESIGN OF MAIN SURVEY SAMPLE RESPONDENTS AND INITIAL SAMPLE MEMBERS: PERCENTAGE OF SUBGROUP IN EACH CLASSIFICATION*

Region	Males		Females		Total	
	Obtained Sample	Initial Sample	Obtained Sample	Initial Sample	Obtained Sample	Initial Sample
Northern Tier (NW & NC)	10.4	10.7	2.9	2.7	13.2	13.3**
Northeast	8.0	8.1	2.0	1.9	9.9	10.0
Southeast	11.3	11.0	2.5	2.4	13.8	13.3
Southcentral	14.3	13.5	3.3	3.1	17.6	16.7
South West, Alaska, Hawaii, Canal Zone	18.5	18.4	5.2	5.0	23.7	23.4
Far East	5.2	5.5	1.1	1.2	6.3	6.7
Europe, Greece, Turkey	6.7	7.3	2.5	2.7	9.2	10.0
United Kingdom	4.9	5.3	1.3	1.4	6.2	6.7

*NOTE: Percentages are based on the combined total number of males and females in each sample, not on the within-sex totals.

**May not equal 100% because of rounding.

5. ANALYSIS OVERVIEW

This chapter is a guide to SRA's analysis of the 1984 Air Force Survey of Work Groups presented in Chapters 6-9. The research provides insight into U.S. Air Force work groups today and the changes that might occur in USAF work groups if the mix of enlisted men and women were altered. Four general outcome measures are examined: individual commitment to the work group and to the Air Force, individual performance and availability, group performance and morale, and sexual harassment. Chapter 10 shifts the focus to an examination of these issues from the perspective of senior officers.

The Survey of Work Groups collected data from almost 12,000 enlisted persons around the world who completed a group-administered written questionnaire.[1] The sample is representative of all active duty enlisted personnel who were assigned to Air Force bases in the fall of 1984. Therefore, conclusions drawn from the research can be generalized to the Air Force enlisted population (except for students, those assigned to non-Air Force activities, and workers in Geographically Separated Units, GSUs, who were excluded from the sample). Personnel at GSUs and two Korean bases were surveyed and will be analyzed in a later report. The senior officer analysis uses personal interview data collected from 60 officers with command responsibility at the 30 bases from which the main sample was drawn.

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[1] A subsample of 801 persons also participated in a personal interview. The analysis makes selected use of this data. However, it does not focus on enlisted personnel in Geographically Separated Units, nor does it examine the two case study bases located in South Korea.

This study makes a special effort to collect and analyze data on Air Force work groups to investigate the linkages between individual and group performance on the one hand, and individual and group characteristics on the other. Because work groups are the basic organizational building blocks in the Air Force, factors that influence the ability of groups to perform will also affect overall performance and readiness.

The following sections provide a general framework for the analyses presented in Chapters 6 through 9:

- **Analysis Objectives** -- Outcome measures and key independent variables of the multivariate analyses;
- **Descriptive Statistics** -- Salient characteristics of enlisted personnel and their work groups;
- **Analysis Methodology** -- Statistical procedures, population weights, sample design effects, criteria for statistical significance, and caveats to the analysis.
- **Glossary** -- Definitions of all independent variables used in the regression analyses.

5.1 ANALYSIS OBJECTIVES

There are a number of criteria for assessing the value of enlisted personnel and work groups to the Air Force. This analysis focuses on four general areas that are either directly or indirectly related to group performance, and are measurable by written questionnaire. The statistical analyses examine several dimensions of each general area to capture the potential effects of changing the work group gender mix. The four general areas, and their respective components, define the dependent variables of the research:

- **Individual Commitment (Chapter 6)**
  - --Desire to transfer out of the work groups
  - --Desire to leave the Air Force before completing a service obligation
  - --Expected career length

- **Individual Performance and Availability (Chapter 7)**
  - --Ability to deploy quickly
  - --Availability for temporary duty (TDY)
  - --Lost work time

- **Group Performance (Chapter 8)**
  - --Ability to deploy quickly
  - --Morale
  - --Work around (individuals not carrying their own weight)

- **Sexual Harassment (Chapter 9)**
  - --Verbal harassment
  - --Physical harassment.

The statistical analysis uses data collected from respondents to the 1984 Air Force Survey of Work Groups to estimate the principal correlates of the indicators noted above. Multivariate regression techniques are used to estimate the relationships between each outcome variable and a variety of individual and group characteristics. A strength of this approach is that it does not rely on questions that ask individuals directly about the effects of women that could reflect attitudes and prejudices as much as objective appraisals, thereby undermining efforts to obtain objective insights.

Several individual and group characteristics are especially important to the Air Force for evaluating policy and for responding to congressional inquiries. Key variables under investigation include:

- Gender of an individual
- Mix of men and women in a work group
- Sex of a group's supervisor
- Size of a work group
- Quality of a group's supervisor
- Functional area of a group.

Section 5.2 presents descriptive statistics on the key independent variables used in this study. These characteristics are relevant to the Air Force because their relationships to the outcome measures will shed light on issues such as:

- How does the performance, availability, and commitment of men and women differ?
- How do marital and dependent status affect the performance, availability, and commitment of personnel?
- Are group performance and morale affected by the male-female composition of the group, and by group size?
- Is the individual commitment of men and women to their work groups and to the Air Force affected by the concentration of women in the group?
- Do the sex and quality of a group's supervisor affect individual and group performance?
- Are there predominant patterns in individual and group performance across functional areas after controlling for other differences?

The multivariate regression analysis controls for the influence of other personal and group characteristics to obtain unbiased estimates of the relationships between the key independent and dependent variables noted above.

The following personal and group control variables are used in the regression models and are discussed in Chapters 6-9. Exceptions are noted on a case-by-case basis.

- **Group Characteristics**
  - Composition by sex-marital-dependents status
  - Presence of officers and civilians
  - Relative group experience (Ratio of E1-3 to all enlisted)
  - Work schedule
  - Racial composition
  - Pace and stress of work
  - Physical index (strength requirement, exposure to dirt on the job)
  - Work environment index (hazardous, outdoors, extreme temperatures)
  - Personnel and equipment shortages
  - Type of work group.

- **Personal Characteristics**
  - Education
  - Family status (marital and dependents)
  - Pregnancy status of member or spouse
  - Race
  - Years of service
  - Whether or not respondent is a supervisor
  - Air Force Specialty Code (AFSC)
  - Whether respondent also has a civilian job.

To illustrate the importance of controlling for other factors in the estimation, consider the following example. Cross-tabulations indicate that, on average, (1) men have more years of experience than women; (2) men exhibit a greater attachment to the Air Force than women; and (3) individuals with more YOS indicate greater commitment than those with less YOS.

Hence, if the correlation between sex and YOS is ignored, then a simple bivariate analysis would indicate that men show a greater commitment to the Air Force than women, when in fact, the difference masks an underlying difference in experience. The multivariate regression techniques used in this analysis avoid such spurious relationships by simultaneously controlling for the influence of many factors to isolate the independent relationships of interest.

5.2 DESCRIPTIVE OVERVIEW

This section gives an overview of the sample and the enlisted population that it represents. The descriptive statistics serve as an introduction to the empirical analysis. Note that the discussion refers to estimates of the enlisted population using sample data that have been weighted to compensate for the oversampling of females.[2] Therefore, reported statistics should be interpreted as Air Force enlisted population estimates. The population of inference, however, excludes enlisted personnel who were students, were assigned to activities outside the Air Force, or were assigned to Geographically Separated Units.

The sample consists of 2454 women (20.9%) and 9282 men (79.1%), for a total of 11,736 persons (39 had missing data on sex). Weighting the data yields an estimated population of 45,346 women (11.4%) and 351,742 men (88.6%), for a total of 397,087. The implied population distribution by sex and ethnicity is reported in Table 5-1. About three-quarters of the enlisted population are white (including a small handful of individuals not elsewhere classified). A larger percent of the women are black as compared to enlisted men, whereas proportionately more men report being of Hispanic origin.

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[2] Females were sampled at exactly twice the male selection rate and the sampling weights reflect this differential. The weights also compensate for the less than 100% response rate to the survey. As noted in Chapter 4, there is no evidence of any nonresponse bias.

TABLE 5-1

DISTRIBUTION BY SEX AND ETHNICITY
(Row Percentages*)

	Ethnicity				
Sex	Hispanic	Black	Oriental, Indian	White	Sex Distribution
Male	5.2	11.9	4.8	73.1	88.8
Female	3.8	21.5	4.1	70.5	11.4
Race Distribution	5.0	17.4	4.8	72.8	100.0

*Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data, weighted to correct for the oversampling of females.

Based on the weighted survey data, 15.9% of the women and 27.2% of the men are work group supervisors. Because supervisor status is linked to pay grade and experience, this male-female difference is expected because females have fewer years of service than males. Table 5-2 shows that women generally have less experience than men. In particular, men are twice as likely as women to have been in the Air Force for 8 or more years. Two important reasons explain this disparity: (1) female accessions did not increase appreciably until after 1973, and (2) females have lower reenlistment rates than men (Military Women in the Department of Defense, 1984).

TABLE 5-2

DISTRIBUTION BY SEX AND YEARS OF SERVICE
(Column Percentages*)

Sex	Years of Service YOS<4	 4≤YOS<8	 YOS≥8	Sex Distribution
Male	41.9	21.2	36.9	88.6
Female	50.9	31.6	17.5	11.4
Race Distribution	42.9	22.4	34.7	100.0

*Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data, weighted to correct for the oversampling of females.

An important analysis variable is the marital-dependent status of men and women. It would be important for the Air Force to know if family responsibilities would conflict with Air Force obligations, thereby affecting group as well as individual performance and availability. Moreover, it is unclear from intuition whether the effects of family status, if any, differ for men and women. Before exploring these questions with multivariate analysis, it is important to understand how the population of enlisted personnel is distributed by marital-dependent status. Table 5-3 displays the population frequency by family type.

TABLE 5-3

FAMILY STATUS BY MEMBER'S SEX
(Column Percentages*)

Family Status	Member's Sex		Row Average
	Male	Female	
Single w/o Children[a]	35.8	38.7	36.1
Single w/Children	2.2	9.8	3.1
Military Spouse[b] w/o Children	2.7	18.2	4.5
Military Spouse w/Children	3.2	19.9	5.1
Civilian Spouse[c] w/o Children	15.9	7.0	14.9
Civilian Spouse w/Children	40.2	6.5	36.4
Sex Distribution	88.6	11.4	100.0

*Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data, weighted to correct for the oversampling of females.

[a] Children include those under the age of 18 living with the survey respondent.

[b] Military spouse includes only those on active duty.

[c] Civilian spouse includes those in the Guard or Reserves (.4% of the population).

Table 5-3 reveals several interesting demographic patterns. First, approximately the same percentage of men and women are single and have no children. However, men and women differ substantially in terms of single-parent status:

the incidence of parenthood among single females is over four times greater than it is among single men. Second, married men are much more likely to have a civilian rather than a military spouse, while the opposite holds true for women.[3] Finally, married men are much more likely to have children living with them (43.4%) than married women (26.4%). This information on family status is particularly useful when combined with the regression results presented in the analysis chapters.

Group size and the mix of men and women in work groups are also important variables in the analysis. The Survey of Work Groups was carefully designed to get respondents to focus on and describe their respective work groups. This was crucial because our study of individual and group relationships requires accurate information on the actual group of people with whom each respondent works on a regular basis (or most recently in the case of changing crews). Extensive feedback from respondents during both the pretest and the final administration of the survey indicate that this goal was realized in virtually all cases.

Survey respondents were asked to identify the type of work group that best described their circumstances. Based on the responses, we are able to infer the pattern for the overall population:

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[3] This is certainly due, in part, to the 9-to-1 ratio of men to women in the enlisted force, which increases the opportunity for an enlisted woman to marry a man in the Air Force.

Group Type	Percent of Population
Small, stable team	51.8%
Part of a larger shift	32.1
Changing crew	5.6
Supervisor of supervisors	7.0
One-deep person	3.2
None of the above	.3
TOTAL	100.0%

The regression models test for any differential effects by controlling for the type of work group: changing crews, groups consisting of supervisors and support staff, and one-deep persons. Small, stable teams and groups that are part of a larger shift are the reference groups in the regression analysis and are thus excluded.

Table 5-4 displays the pattern in the percent female in work groups by group size. This distribution suggests there is sufficent variation in group size and percent female to analyze the effects of different mixes of men and women on group and individual performance. Approximately 90% of the enlisted population work in groups with no more than 20 persons on a day-to-day basis. In fact, about 95% work in groups of under 28 persons, and 99% in groups of under 63 people. In the opposite direction, 10% of the population work in groups of 3 people or less, and about 29% in groups of no more than 5 people.

TABLE 5-4

WORK GROUP SIZE BY PERCENT FEMALE
(Percentages*)

Group Size (persons)	Percent Female In Group (F)				Group Size Distribution
	F=0	0<F<.15	.15≤F<.30	.30≥F	
1 to 5					
Row %	60.3	**	17.2	22.6	28.6
Col %	37.5	**	27.9	39.5	
6 to 10					
Row %	44.8	18.9	18.1	18.1	29.0
Col %	28.3	27.2	29.9	32.3	
11 to 15					
Row %	36.4	30.4	19.6	13.5	19.6
Col %	15.6	29.5	21.9	16.3	
16 to 20					
Row %	32.6	37.6	19.6	10.3	13.2
Col %	9.4	24.6	19.7	8.3	
21 or More					
Row %	44.3	39.3	10.3	6.2	9.6
Col %	9.3	18.8	5.6	3.6	
Percent Female Distribution	45.6	20.2	17.6	16.3	100.0

*Percentages are rounded to the nearest tenth. Statistics reflect self-reported group size and numbers of women (divided by total) by survey respondents, weighted to correct for the oversampling of females.

**There is no male-female mix that can satisfy the definition of this table cell.

The mix of men and women in work groups is quite varied, although the predominant characteristic is that 45.6% of the enlisted population are in all-male groups. Despite this concentration, the average proportion of women in all work groups is 13.2%. However, the distribution by percent women is skewed. Table 5-4 shows that 20.2% are in groups with at most 15% women; 37.8% are in groups with up to 30% women; and 16.3% are in groups with at least 30% women.

Table 5-5 shows the distribution of enlisted men and women across functional areas, for both the sample and the overall population after applying the sampling weights. The sample and population sizes in the table serve two purposes. First, they can be used in conjunction with similarly formated tables elsewhere in this report to estimate population subgroups. Second, the sample cells, by function and sex, indicate where the sample is capable of supporting reliable inferences by functional area.

5.3 ANALYSIS METHODOLOGY

This section discusses the statistical methodology used to estimate the empirical relationships between the dependent and independent variables noted in Section 5.1. All of the empirical models presented in Chapters 6 through 9 are estimated with ordinary least squares (OLS) regression methods.

TABLE 5-5

ENLISTED PERSONNEL BY FUNCTIONAL AREA AND SEX (Fall 1984)

Functional Area of Work Group*	Sample Size		Estimated Population	
	Male	Female	Male	Female
Civil Engineering	640	77	24,457	1,431
Comptroller	171	118	6,418	2,205
Depot Ops. & Maint.	141	28	5,340	529
Ground Comm. & Elec. Ops. & Maint.	758	188	28,527	3,470
Intelligence	213	112	8,469	2,016
Medical	387	307	14,549	5,669
Operations-Flight	532	115	20,040	2,112
Manpower & Personnel	204	133	7,692	2,443
Research & Developmt.	59	16	2,274	299
Security Police	785	66	30,111	1,233
Supply, Services, & Contracting	812	364	30,515	6,719
Training	340	100	13,174	1,855
Transportation	350	95	13,505	1,812
Weapons Systems Maintenance	3,323	437	125,097	8,053
Administration, Command, & Other	494	283	18,754	5,218
COLUMN TOTAL	9,209	2,439	348,920	45,063
COLUMN TOTAL (w/missing data)	9,282	2,454	351,746	45,348

*Functional area is based on self-reported survey data. Population estimates reflect the application of sampling weights.

Regression analysis is a powerful statistical tool because it yields estimates of the direction and size of a change in a dependent variable associated with a unit change in each independent variable, while simultaneously controlling for the influence of other factors. The estimation technique also calculates the statistical significance of each estimated relationship.

The regression model used takes the form of:

$$Y = a + bK + cG + dP + u.$$

The estimation equation specifies that an outcome variable (Y) is a linear function of a constant term (a), a vector of key individual and group characteristics (K), a vector of group characteristics (G), a vector of personal characteristics (P), and a random disturbance term (u). The estimation procedure estimates the model's parameters, the intercept term (a) and the vectors of coefficients (b,c,d), that minimize the sum of squared residuals.

Interpretation of Estimated Coefficients. Two kinds of independent variables are used in the analysis: continuous and categorical. The estimated coefficient on a continuous independent variable indicates how a small change in magnitude will affect the dependent variable, other things held constant.[4] The estimated coefficient on a categorical variable indicates the difference between it and the excluded reference category.

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[4] In terms of calculus, the estimated regression coefficient can be interpreted as a partial derivative.

For example, a work group's functional area can be one of 15 categories, and a respondent's sex is either male or female. In the regression model, these categories are included as a series of "dummy variables", each taking on the value of either 0 or 1. If a respondent works in the first functional area, then its corresponding dummy variable takes on the value of 1 and all of the other functional area dummy variables take on the value of 0. The same logic applies to all other sets of dummy variables.

In estimating the regression equation, a reference category for each set of dummy variables must be omitted from the equation.[5] For example, at least one of the 15 functional areas must be excluded from the equation. The omitted category then serves as the benchmark against which all of the other functional categories are compared. Therefore, an estimated coefficient on one of the included functional areas tells us how individuals or work groups in that area differ from those in the excluded functional area. In the case of estimating the effect of gender on individual performance, males are excluded from the equation. The estimated coefficient on the female dummy variable would indicate the predicted difference between the two sexes, other things held constant.

Statistical Significance of the Coefficients. This research is primarily concerned with hypothesis testing -- whether or not a particular variable has an effect on an outcome variable that is statistically significant. In the case of a continuous independent variable, this involves testing to see if the estimated coefficient is significantly different from zero.[6] In the case of a dummy variable, the test for a zero coefficient refers to an effect that is significantly different from the excluded reference category. There are other statistical tests, such as the significance of the sum of two or more estimated coefficients, for which the reader can consult a standard econometrics text (e.g., Kmenta, 1971).

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[5] The choice of which category to omit from the regression equation is arbitrary. It does not affect the estimation, although the coefficients on a set of dummy variables will change according to which category serves as the reference group.

A significant coefficient implies that a systematic relationship exists between an independent and dependent variable. However, significance does not convey any information about the magnitude of the effect. For example, an independent variable may be very significantly related to a performance measure, but the size of the coefficient could be quite small. This distinction is important when interpreting the regression coefficients presented in the next chapters. In a large sample, such as the Survey of Work Groups, one generally finds that (1) a large coefficient is statistically significant, but that (2) a significant coefficient does not necessarily imply a quantitatively large effect, while (3) an insignificant coefficient is usually small in size.

Sample Design and Levels of Significance. By convention, statistical significance for hypothesis testing is generally set at the 5% level or lower. The associated t-ratio for the 5% level of significance is 1.96 -- a t-ratio greater than 1.96 would lead to the rejection of the null hypothesis that a specific coefficient estimate is insignificantly different from zero.[7] When reporting the regression results, it is also common to indicate higher levels of significance (e.g., 1% level, implying a t-ratio of 2.58 or higher) to point out especially significant coefficients.

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[6] For a regression model, this is done by dividing the estimated coefficient by its estimated standard error. The result is a statistic referred to as a "t-ratio". Conventional levels of statistical significance are used in conjunction with the t-ratio to determine whether or not the estimated coefficient is statistically different from zero.

The significance tests used in this study, however, depart from conventional statistical criteria because the Survey of Work Groups is a clustered random sample. The first stage of the sampling selected 30 out of 120 Air Force bases worldwide. The second stage randomly selected individuals from each base. This sample design resulted in a clustered sample by base. To compensate for any "base effect" in the regression results, this analysis requires that t-ratios be 1.25 times higher than the conventional criteria dictate.[8] Hence, a larger, more conservative t-ratio is required before accepting an estimated coefficient as statistically different from zero. The operative criteria are:

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[7] In general, a two-tailed test is used.

[8] There are two related reasons for raising the required level of significance. First, clustering increases the chances of excluding population subgroups that may exhibit different patterns of relationships than suggested by the sample. This would argue for enlarging the confidence interval around the estimated coefficients based on a clustered sample. Second, individuals residing on an Air Force base may be susceptible to an unobserved "base effect" that tends to lower the standard errors on the coefficients. Requiring a t-ratio that is 1.25 times higher than conventional criteria ensures that our conclusions are statistically reliable by even the most conservative measures (see Kish and Frankel, 1974, and Frankel, 1983).

5% level of significance = t-ratio of 2.45
1% level of significance = t-ratio of 3.22.

Sample Design and the Use of Weighted Data. The sample design called for women to be selected at twice the rate of men. Therefore, twice as many women are in the sample as are in the enlisted population. All cross-tabulations are based on "weighted" data to correct for the oversampling of women and to obtain accurate population inferences.

The regression equations are also estimated with weighted data. The rationale for doing so is that observed relationships between dependent and independent variables may differ systematically by gender.[9] If so, estimates based on unweighted data would reflect a disproportionate influence of females. Preliminary regressions compared the estimated coefficients and t-ratios using weighted and unweighted data. In general, the results were very close. However, because there were a few differences that could be explained by underlying male-female interactions, the regression analysis is conducted with weighted data.

Dichotomous Dependent Variables. Most of the individual and group performance indicators are measured as binary values, taking on the value of either 0 or 1. The multivariate analyses use observations on the 0-1 outcomes to estimate linear probability models of the occurrence of each event.

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[9] If the regression model were correctly specified, the use of weighted data would introduce heteroskedasticity. However, few male-female interactions were modeled, even though some variables were clear candidates for doing so. This, combined with the oversampling of females, argues for using weighted data.

Estimation of a dichotomous dependent variable with OLS regression theoretically results in biased and inconsistent parameter estimates. The OLS regression assumes a linear probability model, when, in fact, the probability should be bounded by 0 and 1, implying a nonlinear model with a curvilinear shape. Overcoming these statistical problems requires the application of maximum-likelihood procedures to estimate the model parameters. In practice, however, the results from OLS regression and maximum-likelihood models, such as probit and logit, are very similar in sign, magnitude, and significance (see Maddala, 1983).

Because of the large number of alternative model specifications examined for each of the 11 dependent variables, OLS regression is used to conserve resources. Several bench tests were performed to see if the OLS estimates were close to those obtained from a theoretically more appropriate functional form. Comparisons of the two indicate that, with few exceptions, the OLS technique yields estimated coefficients that are in close agreement with those estimated by a logit model.

Regression Models. Two regression models are reported for most of the dependent variables:

- **Model 1** -- Supervisor quality is not included with the other personal and group-related independent variables;

- **Model 2** -- Supervisor quality is included along with the other independent variables.[10]

In principle, we expect supervisors to play an instrumental role in affecting individual and group performance, encouraging personal commitment, and discouraging sexual harassment. The quality and effectiveness of a supervisor consist of factors such as leadership, technical skill, sense of fairness, and management ability. The effect of supervisor quality estimated in our analysis is important to the Air Force because it is a variable over which it can exert some control.

Caveats. Statistical problems may arise when the "supervisor quality" variable is included in the regression model. These may occur for two reasons. First, supervisor quality may be endogenous, in which case, it is correlated with the random disturbance term and its estimated coefficient is biased. Moreover, all of the other coefficients in the model also run the risk, theoretically, of being biased when an endogenous right-hand-side variable is included. Presentation of both Model 1 and Model 2 coefficients permits examination of these potential effects.

A second problem stems from the way in which the survey collected data on work groups. Survey respondents served as reporters or data collection agents for their respective work group. This approach, however, risks confounding objective descriptions of group characteristics and performance with the subjective opinions of the respondent. This phenomenon, known as the "halo effect", occurs when respondents color their description of all group attributes by how positively or negatively they feel toward their group. For example, someone who feels very positive about his group is more likely to describe every facet of the group favorably without attempting to point out exceptions.

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[10] Only Model 2 is used for the individual performance and sexual harassment analyses. Preliminary tests found that the coefficients remained stable with and without the supervisor quality index.

The danger posed by the halo effect is that respondents may create a relationship that does not exist. Hence, ascribing causality to a relationship between supervisor quality and a given dependent variable could be misleading. This may be a particularly serious problem when the dependent variable is either (1) group morale, or (2) individual commitment to the work group. These two variables, along with a respondent's evaluation of his or her supervisor quality may, instead, reflect an individual's overall satisfaction with the work group.

Interpretation of Tables. The tables presented in the following analysis chapters describe how each dependent variable is distributed across functional area, the percent female in a group, and sex of respondent. Differences between any two table cells, however, must be interpreted with caution. Apparent differences may not be statistically significant. The t-ratio for the difference between two estimated proportions (P and Q) for cells 1 and 2 in a table is equal to:

$$\text{t-ratio} = \frac{P - Q}{\sqrt{\frac{def_1{}^2 * P(1-P)}{n_1} + \frac{def_2{}^2 * Q(1-Q)}{n_2}}}$$

where "def" is a sample design effect factor. Because of the clustered sample design, the implied standard deviations of the estimated proportions, and the standard errors of their differences, are larger than with a simple random sample. If the t-ratio calculated from the above formula is greater than 1.96, then the difference between the two cell proportions is statistically different from zero at the 5% level; if greater than 2.33, the difference is significant at the 1% level.[11]

The report concentrates on estimating the relationships between independent and dependent variables using multivariate regression techniques. It does not calculate the statistical significance of comparisons between all possible group proportions. However, t-ratios can be computed with the information in this report for comparisons between men and women, and between cell proportions in the functional area-by-sex tables presented in Chapters 6-9.

The values required by the above t-ratio formula are found in two tables: (1) the functional area-by-sex table reporting the cell proportions of interest; and (2) the cell sizes and design effect factors presented in Table 5-6.

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[11] Note that the above formula for calculating the t-ratio includes the design effect. Hence, conventional significance criteria of 1.96 and 2.33 are used. In contrast, the t-ratios computed by the regression computer program are not adjusted for the design effect. Therefore, more stringent significance criteria are used as discussed above.

The following example illustrates how this information is used to test for the significance between two proportions. Table 6-2 shows the difference between the proportion of women (.375) and men (.307) who want to transfer out of their work groups is equal to P-Q = .068. Inserting the respective cell sizes of n_1 = 2454 and n_2 = 9282, and the respective design effect factors (which are squared in the above formula) of def_1 = 1.63 and def_2 = 2.70 into the formula yields a t-ratio of 3.31. The two proportions are statistically different at the 1% level.

Confidence intervals can also be constructed around estimates of proportions. Here again, the standard deviation of the proportion must be adjusted for the sample design effect (by multiplying the standard deviation by "def"). A 95% confidence interval can then be created by multiplying the adjusted standard error by 1.96 and adding and subtracting the product to the proportion.

For example, 85.5% of all enlisted personnel report that all or most of their work group could deploy quickly. In this case a design effect factor of 3.08 (the def for the entire sample is not reported in Table 5-6) is used along with n = 11,736 to calculate the adjusted standard deviation of the proportion, which is then multiplied by 1.96 to obtain the 95% confidence interval: .855 ± .006.

TABLE 5-6

INFORMATION FOR CALCULATING T-STATISTICS FOR THE DIFFERENCE BETWEEN TWO PROPORTIONS

Functional Area of Work Group*	Sample Size		Design Effect Factor	
	Male	Female	Male	Female
Civil Engineering	640	77	1.20	1.04
Comptroller	171	118	1.05	1.06
Depot Ops. & Maintenance	141	28	1.04	**
Ground Comm. & Elec. Ops. & Maint.	758	188	1.23	1.06
Intelligence	213	112	1.07	1.03
Medical	387	307	1.12	1.10
Operations-Flight	532	115	1.17	1.03
Manpower & Personnel	204	133	1.06	1.04
Research & Developmt.	59	16	**	**
Security Police	785	66	1.24	**
Supply, Services, & Contracting	812	364	1.25	1.12
Training	340	100	1.11	1.03
Transportation	350	95	1.11	1.03
Weapons Systems Maintenance	3,323	437	1.81	1.14
Administration, Command, & Other	494	283	1.15	1.09
COLUMN TOTAL	9,209	2,439	2.70	1.63
COLUMN TOTAL (w/missing data)	9,282	2,454	2.70	1.63

*Functional area is based on self-reported survey data.

**Cell size is too small to obtain statistically reliable estimates.

5.4 GLOSSARY

The definitions of all independent variables used in the multivariate analyses are presented below. The glossary is organized into three parts: key characteristics, individual characteristics, and group characteristics. In some cases, different definitions are provided because of alternative model specifications used in the regression equations.

GLOSSARY OF INDEPENDENT VARIABLES IN THE REGRESSION EQUATIONS

Intercept Term--the value that the dependent variable takes if all of the independent variables are equal to 0 in the regression equation.

KEY CHARACTERISTICS

Sex of Respondent

Male Respondent--a dummy variable that takes on the value of 1 if the respondent is male (Q130=A) and 0 if not.

Female Respondent--a dummy variable that takes on the value of 1 if the respondent is female (Q130=B) and 0 if not.

Male in an All-Male Group--a dummy variable that takes on the value of 1 if the respondent is male and has no females in his work group (Q130=A and Q13=0) and 0 if not.

Male in a Mixed Group--a dummy variable that takes on the value of 1 if the respondent is male and has females in his work group (Q130=A and Q13>0) and 0 if not.

Sex-YOS Interaction

Male, YOS<4 Years--a dummy variable that takes on the value of 1 if the respondent is male and has not completed 4 years of active service (Q130=A and Q144=A,B,C, or D) and 0 if not.

Female, YOS<4 Years--a dummy variable that takes on the value of 1 if the respondent is female and has not completed 4 years of active service (Q130=B and Q144=A,B,C, or D) and 0 if not.

Male, YOS4-7 Years--a dummy variable that takes on the value of 1 if the respondent is male and has completed between 4 and 7 years of active service, inclusive (Q130=A and Q144=E,F,G, or H) and 0 if not.

Female, YOS4-7 Years--a dummy variable that takes on the value of 1 if the respondent is female and has completed between 4 and 7 years of active service, inclusive (Q130=B and Q144=E,F,G, or H) and 0 if not.

Male, YOS>8 Years--a dummy variable that takes on the value of 1 if the respondent is male and has completed 8 or more years of active service (Q130=A and Q144=I,J,K,L, or M) and 0 if not.

Female, YOS>8 Years--a dummy variable that takes on the value of 1 if the respondent is female and has completed 8 or more years of active service (Q130=B and Q144=I,J,K,L, or M) and 0 if not.

Sex-Family Status Interaction

Male, Single, w/o Children--a dummy variable that takes on the value of 1 if the respondent is male and is not presently married (or is separated, widowed, or divorced) and has no dependents under the age of 18 living with him (Q130=A, Q137=A,E,F,G, or H, and Q141=A) and 0 if not.

Male, Military Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is male and is married to an active duty military spouse and has no dependents under the age of 18 living with him (Q130=A, Q137=B, and Q141=A) and 0 if not.

Male, Civilian Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is male and is married to a civilian, guard, or reserve spouse and has no dependents under the age of 18 living with him (Q130=A, Q137=C or D, and Q141=A) and 0 if not.

Female, Single, w/o Children--a dummy variable that takes on the value of 1 if the respondent is female and is not presently married (or is separated, widowed, or divorced) and has no dependents under the age of 18 living with her (Q130=B, Q137=A,E,F,G, or H, and Q141=A) and 0 if not.

Female, Military Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is female and is married to an active duty military spouse and has no dependents under the age of 18 living with her (Q130=B, Q137=B, and Q141=A) and 0 if not.

Female, Civilian Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is female and is married to a civilian, guard, or reserve spouse and has no dependents under the age of 18 living with her (Q130=B, Q137=C or D, and Q141=A) and 0 if not.

Male, Single, w/Children--a dummy variable that takes on the value of 1 if the respondent is male and is not presently married (or is separated) and has at least one dependent under the age of 18 living with him (Q130=A, Q137=A,E,F,G, or H, and Q141=B, C,D,E,F,G,H, or I) and 0 if not.

Male, Military Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is male and is married to an active duty military spouse and has at least one dependent under the age of 18 living with him (Q130=A, Q137=B, and Q141=B,C, D,E,F,G,H, or I) and 0 if not.

Male, Civilian Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is male and is married to a civilian, guard, or reserve spouse and has at least one dependent under the age of 18 living with him (Q130=A, Q137=C or D, and Q141=B,C,D,E,F,G,H, or I) and 0 if not.

Female, Single, w/Children--a dummy variable that takes on the value of 1 if the respondent is female and is not presently married (or is separated) and has at least one dependent under the age of 18 living with her (Q130=B, Q137=A,E,F,G, or H, and Q141=B,C,D,E,F,G,H, or I) and 0 if not.

Female, Military Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is female and is married to an active duty military spouse and has at least one dependent under the age of 18 living with her (Q130=B, Q137=B, and Q141=B,C, D,E,F,G,H, or I) and 0 if not.

Female, Civilian Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is female and is married to a civilian, guard, or reserve spouse and has at least one dependent under the age of 18 living with her (Q130=B, Q137=C or D, and Q141=B,C,D,E,F,G,H, or I) and 0 if not.

Percent Female--a continuous variable that is equal to the ratio of the number of women in the group to total group size (Q13/Q12).

Group Size--a variable that is equal to the total number of people in the respondent's work group (Q12).

Female Respondent-Percent Female Interaction--a continuous variable equal to the product of Female Respondent and Percent Female and thus takes on the value of 0 for males and the value of Percent Female for females.

Supervisor Quality Index--a variable ranging from 1 to 5 that is equal to the average of the respondent's answers to questions 66,68,70,71,72,73,74,75, and 76, when the questions are rescaled so that 5 is the most positive response and 1 the most negative.

Female Supervisor--a dummy variable that takes on the value of 1 if the respondent's supervisor is female and 0 if not (Q64=B).

Functional Area

Civil Engineering--a dummy variable that takes on the value of 1 if the respondent's functional area is Civil Engineering (Q25=A) and 0 if not.

Comptroller--a dummy variable that takes on the value of 1 if the respondent's functional area is Comptroller, which includes Accounting and Finance (Q25=B; or Q25=O and the first 2 digits of Q125 are 51) and 0 if not.

Depot Ops. & Maintenance--a dummy variable that takes on the value of 1 if the respondent's functional area is Depot Operations and Maintenance, which includes Material and Logistics Management; and Supply and Transportation (Q25=C and the first 2 digits of Q125 are not 39,42,43,63, or 64) and 0 if not.

Grd. Comm., Elec. Ops.--a dummy variable that takes on the value of 1 if the respondent's functional area is Ground Communications, Electronic Operations and Maintenance, which includes Telecommunications/Flight Facilities, Engineering, and Installations (Q25=D and the first 2 digits are not 20,32,34,42, or 43; or Q25=O and the first 2 digits of Q125 are 27; or Q125=L and the first 2 digits of Q125 are 30) and 0 if not.

Intelligence--a dummy variable that takes on the value of 1 if the respondent's functional area is Intelligence (Q25=E) and 0 if not.

Medical--a dummy variable that takes on the value of 1 if the respondent's functional area is Medical (Q25=F) and 0 if not.

Operations-Flight--a dummy variable that takes on the value of 1 if the respondent's functional area is Operations, which includes Flight Crews and Safety (Q25=G) and 0 if not.

Manpower & Personnel--a dummy variable that takes on the value of 1 if the respondent's functional area is Manpower & Personnel (Q25=H) and 0 if not.

Security Police--a dummy variable that takes on the value of 1 if the respondent's functional area is Security Police (Q25=J) and 0 if not.

Supply, Services and Contracting--a dummy variable that takes on the value of 1 if the respondent's functional area is Supply, Services, and Contracting, which includes Commissary; Morale, Welfare, and Recreation; Procurement; and Logistic Plans (Q25=K; or Q25=C and the first 2 digits of Q125 are 63 or 64) and 0 if not.

Training--a dummy variable that takes on the value of 1 if the respondent's functional area is Training (Q25=L and the first 2 digits of Q125 are not 30 or 34; or Q25=D and the first 2 digits of Q125 are 20) and 0 if not.

Transportation--a dummy variable that takes on the value of 1 if the respondent's functional area is Transportation (Q25=M) and 0 if not.

Weapons Sys. Maint.--a dummy variable that takes on the value of 1 if the respondent's functional area is Weapons System Maintenance, which includes Aircraft, Munitions, and Missile Maintenance; and Maintainance Standards Evaluation Teams (Q25=N; or Q25=C and the first 2 digits of Q125 are 39,42,or 43; or Q25=D and the first 2 digits of Q125 are 32,34,42,or 43; or Q25=L and the first 2 digits of Q125 are 34; or Q25=O and the first 2 digits of Q125 are 39) and 0 if not.

R&D, Admin., Command, and Other--a dummy variable that takes on the value of 1 if the respondent's functional area is Research & Development, Administration, Command, or Other, which includes Photographic, Judge Advocate, Inspector General, Public Affairs, Chaplain, Band, Mortuary, Cartography, and Weather (Q25=O and the first 2 digits of Q125 are not 27,39, or 51).

INDIVIDUAL CHARACTERISTICS

Race

NonBlack, NonHispanic--a dummy variable that takes on the value of 1 if the respondent's racial or ethnic group is not black, Afro/American, Hispanic, Puerto Rican, Mexican, Cuban, Latin, Chicano, or Other Spanish (Q131=A,D, or E) and 0 if not.

Black--a dummy variable that takes on the value of 1 if the respondent's racial or ethnic group is black or Afro-American (Q131=B) and 0 if not.

Hispanic--a dummy variable that takes on the value of 1 if the respondent's racial or ethnic group is Hispanic, Puerto Rican, Mexican, Cuban, Latin, Chicano, or Other Spanish (Q131=C) and 0 if not.

Education

High School, Trade or Technical School--a dummy variable that takes on the value of 1 if the respondent's highest level of education completed is high school or trade or technical school (Q133=B or D) and 0 if not.

Less Than High School, or GED--a dummy variable that takes on the value of 1 if the respondent's highest level of education completed is some high school (without graduation) or a GED equivalent (Q133=A or C) and 0 if not.

Some College and Beyond--a dummy variable that takes on the value of 1 if the respondent's highest level of education completed is some college, a college degree, or graduate work beyond bachelor degree (Q133=E,F, or G) and 0 if not.

Family Member Pregnant--a dummy variable that takes on the value of 1 if the respondent or the respondent's spouse is pregnant (Q142=B) and 0 if not.

Respondent Has a Civilian Job--a dummy variable that takes on the value of 1 if the respondent has a civilian job (Q145=C,D, or E) and 0 if not.

Respondent Owns Home--a dummy variable that takes on the value of 1 if the respondent owns a home (Q134=D) and 0 if lives on base or rents.

Years of Service

YOS<4--a dummy variable that takes on the value of 1 if the respondent has not completed 4 years of active service (Q144=A,B, C, or D) and 0 if not.

YOS4-7--a dummy variable that takes on the value of 1 if the respondent has completed between 4 and 8 years of active service (Q144=E,F,G, or H) and 0 if not.

YOS<8--a dummy variable that takes on the value of 1 if the respondent has completed 8 or more years of active service (Q144=I,J,K,L, or M) and 0 if not.

Live on Base--a dummy variable that takes on the value of 1 if the respondent lives on base (Q137=A or B) and 0 if not.

Family Status

Single, w/o Children--a dummy variable that takes on the value of 1 if the respondent is not presently married (or is separated) and has no dependents under the age of 18 living with him or her (Q137=A,E,F,G, or H, and Q141=A) and 0 if not.

Military Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is married to an active duty military spouse and has no dependents under the age of 18 living with him or her (Q137=B, and Q141=A) and 0 if not.

Civilian Spouse, w/o Children--a dummy variable that takes on the value of 1 if the respondent is married to a civilian, guard, or reserve spouse and has no dependents under the age of 18 living with him or her (Q137=C or D, and Q141=A) and 0 if not.

Single, w/Children--a dummy variable that takes on the value of 1 if the respondent is not presently married (or is separated) and has at least one dependent under the age of 18 living with him or her (Q137=A,E,F,G, or H, and Q141=A,B,C,D,E,F,G,H, or I) and 0 if not.

Military Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is married to an active duty military spouse and has at least one dependent under the age of 18 living with him or her (Q137=B, and Q141=B,C,D,E,F,G,H, or I) and 0 if not.

Civilian Spouse, w/Children--a dummy variable that takes on the value of 1 if the respondent is married to a civilian, guard, or reserve spouse and has at least one dependent under the age of 18 living with him or her (Q137=C or D, and Q141=B,C,D,E,F,G,H, or I) and 0 if not.

Single--a dummy variable that takes on the value of 1 if the respondent has never been married (Q137=A) and 0 if not.

Separated/Widowed/Divorced--a dummy variable that takes on the value of 1 if the respondent is separated, widowed, or divorced (Q137=E,F,G, or H) and 0 if not.

Married, Military Spouse--a dummy variable that takes on the value of 1 if the respondent is married to an active duty military spouse (Q137=B) and 0 if not.

Married, Civilian Spouse--a dummy variable that takes on the value of 1 if the respondent is married to a civilian, guard, or reserve spouse (Q137=C or D) and 0 if not.

Respondent Is a Supervisor--a dummy variable that takes on the value of 1 if the respondent is a supervisor (Q10=B) and 0 if not.

AFSC Group

Support, Admin--a dummy variable that takes on the value of 1 if the respondent is in the occupational grouping of Support and Administration (first 2 digits of Q125 are 34,60,64,65,66,67,69, 70,73,74,75,79, or 82) and 0 if not.

Elec./Mech. Equip. Repair--a dummy variable that takes on the value of 1 if the respondent is in the occupational grouping of Electrical and Mechanical Equipment Repair (first 2 digits of Q125 are 11,36,39,40,42,43,44,46,47,54, or 59) and 0 if not.

Craftsmen and Services--a dummy variable that takes on the value of 1 if the respondent is in the occupational grouping of Craftsmen, Services, and Supply (first 2 digits of Q125 are 24,55,56,61,62,63,81, or 87) and 0 if not.

Skilled Technicians--a dummy variable that takes on the value of 1 if the respondent is in the occupational grouping of Skilled Technicians (first 2 digits of Q125 are 10,20,22,23,25,27,29,30, 31,32,51,57,90,91,92,98) and 0 if not.

GROUP CHARACTERISTICS

Physical Index--a variable that takes on the values of 1 to 5, by half-points, with higher values implying more strength required or a dirtier job (on Q35 and 36, each response was assigned a numerical value equal to its place in the alphabet and averaged).

Environment Index--a variable that takes on the values of 0, .33, .67, and 1, with higher values implying likelihood of working outdoors, in a hazardous area, and in an excessively warm or cold area (on Q53,55, and 56, an 'A' was scored as a 1 and a 'B' was scored as a 0, and the scores were averaged).

Race Composition

At least 1 black member--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 black member (Q14>0) and 0 if not.

At least 1 Hispanic member--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 Hispanic member (Q15>0) and 0 if not.

Rel. Experience (Ratio of E1-3 to All Enlisted)--a continuous variable that measures the ratio of E1-3 to E1-9 (Q11A divided by the sum of Q11A,Q11B, and Q11C).

Sex-Marital-Dependents Status Composition

At least 1 Sgl. Male, w/Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 male member who is not presently married and has a dependent living with him (Q17>0) and 0 if not.

At least 1 Sgl. Female, w/o Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 female member who is not presently married and does not have a dependent living with her (Q18 minus Q19 is greater than 0) and 0 if not.

At least 1 Sgl. Female, w/Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 female member who is not presently married and has a dependent living with her (Q19>0) and 0 if not.

At least 1 w/Military Spouse, w/o Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 member who is married to an active duty military spouse and does not have a dependent living with him/her (Q20 minus Q21 is greater than 0) and 0 if not.

At least 1 w/Military Spouse, w/Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 member who is married to an active duty military spouse and has a dependent living with him/her (Q21>0) and 0 if not.

At least 1 w/Civilian Spouse, w/o Dep.--a dummy variable that takes on the value of 1 if the respondent's work group has at least 1 member who is married to a civilian, guard, or reserve spouse and does not have a dependent living with him/her (Q22 minus Q23 is greater than 0) and 0 if not.

Job Pace

Very Fast Pace--a dummy variable that takes on the value of 1 if the respondent reported that the pace of work last week was very fast (Q49=A) and 0 if not.

Somewhat Fast Pace--a dummy variable that takes on the value of 1 if the respondent reported that the pace of work last week was somewhat fast (Q49=B) and 0 if not.

Neither Fast nor Slow, Somewhat Slow--a dummy variable that takes on the value of 1 if the respondent reported that the pace of work last week was neither fast nor slow or somewhat slow (Q49=C or D) and 0 if not.

Very Slow Pace--a dummy variable that takes on the value of 1 if the respondent reported that the pace of work last week was very slow (Q49=E) and 0 if not.

Job Stress

Very Stressful--a dummy variable that takes on the value of 1 if the respondent reported that the work last week was very stressful (Q50=A) and 0 if not.

Somewhat Stressful--a dummy variable that takes on the value of 1 if the respondent reported that the work last week was somewhat stressful (Q50=B) and 0 if not.

Not Very Stressful--a dummy variable that takes on the value of 1 if the respondent reported that the work last week was not very stressful (Q50=C) and 0 if not.

Not at All Stressful--a dummy variable that takes on the value of 1 if the respondent reported that the work last week was not at all stressful (Q50=D) and 0 if not.

Type of Work Group

Changing Crew--a dummy variable that takes on the value of 1 if the respondent's regular work group is a changing crew (Q6=C) and 0 if not.

Supervisor of Supervisor--a dummy variable that takes on the value of 1 if the respondent is a supervisor of supervisors (Q6=D) and 0 if not.

One-Deep Person--a dummy variable that takes on the value of 1 if the respondent is a "one-deep" worker (Q6=E) and 0 if not.

Any Shortages Last Week

Personnel Shortages--a dummy variable that takes on the value of 1 if the respondent's work group experienced any personnel shortages last week (Q60=B,C,D,E,F,G, or H) and 0 if not.

Equipment Shortages--a dummy variable that takes on the value of 1 if the respondent's work group experienced any equipment shortages last week (Q58=B,C,D,E,F,G, or H) and 0 if not.

Rank Composition

At Least One Officer--a dummy variable that takes on the value of 1 if the respondent's work group has at least one member who is an officer (Q11D>0) and 0 if not.

At Least One Civilian--a dummy variable that takes on the value of 1 if the respondent's work group has at least one member who is a civilian (Q11E>0) and 0 if not.

Work Schedule

Day Shift--a dummy variable that takes on the value of 1 if the respondent's work group does not regularly work an evening, midnight, extended, or irregular shift (Q32=A or E) and 0 if not.

Evening Shift--a dummy variable that takes on the value of 1 if the respondent's work group regularly works an evening shift (Q32=B) and 0 if not.

Midnight Shift--a dummy variable that takes on the value of 1 if the respondent's work group regularly works a midnight shift (Q32=C) and 0 if not.

Extended or Irregular Hours--a dummy variable that takes on the value of 1 if the respondent's work group regularly works extended or irregular hours (Q32=D) and 0 if not.

6. ANALYSIS OF INDIVIDUAL COMMITMENT

This section examines three aspects of individual commitment: one that attempts to measure an individual's commitment to the work group, and two that attempt to measure an individual's commitment to the Air Force. Each is treated as a dependent variable in a series of regression equations, and each is the focus of a series of cross-tabulations with other important variables.

- The commitment to the work group variable is based on data from a survey question that asks respondents if they would transfer to a different work group on the same Air Force base for reasons other than advancement or to change specialty.
- The first commitment to the Air Force variable is based on data from a survey question that asks respondents if, given the opportunity, they would leave the Air Force before their term is completed, or if they are currently taking advantage of one of the Air Force's "early out" programs.
- The second commitment to the Air Force variable is based on the respondent's expected career length.

An individual's commitment to the work group and Air Force is important because it underlies group turnover and is one of the factors that affect individual retention behavior. Furthermore, if patterns of individual commitment are related to the presence or concentration of women in the work group, then a desire to leave the work group or Air Force may imply attitudinal as well as other male-female problems. The measures of individual commitment in this section may therefore serve as an index of the overall satisfaction of the individual. Systematic variation in these indices by various group characteristics may reveal important sources of group friction and dysfunction that could adversely affect performance.

Variation in the dependent variables is explained by a number of independent variables using multiple regression analysis. The independent variables are chosen based on a priori hypotheses that a single factor, or combination of factors, might be significantly related to the desire to transfer from one's work group. These variables are described fully in Chapter 5, Analysis Overview, and in the Glossary at the end of that chapter. Variables unique to a model are described at the beginning of the relevant analysis.

For the purposes of this study, the most important potential relationships from the Air Force's perspective are between the dependent variables and the independent variables linked to the presence of women in the work group: female respondent, percent female in the work group, female respondent-percent female interaction, and female supervisor. Other variables of particular interest to the Air Force are group size, respondent's functional area, and a supervisor quality index.[1]

The leadership and managerial qualities of a supervisor are hypothesized to have a significant influence on individual commitment. Therefore, the supervisor quality index is included in Model 2 of the following regression analyses, but it is excluded from the otherwise identical Model 1. The index ranges from 1 to 5, with 5 being a supervisor of the highest quality.

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[1] The following gender interaction variables were tested and discarded due to insignificant results: (1) a pattern variable that split percent female in group into ranges; (2) a pattern variable that interacted female respondent and family status; (3) a variable that interacted group size and percent female in group; and, (4) a pattern variable that interacted sex of respondent and sex of supervisor.

6.1 DESIRE TO TRANSFER TO ANOTHER WORK GROUP

Desire to transfer to another work group attempts to measure an individual's satisfaction with the current work group, and thus his or her commitment to the group. It is influenced by a wide set of personal, organizational, and environmental factors that interact with an individual's expectations and goals.

Commitment to the work group is defined by Question 26 of the Survey of Work Groups:

> 26. Would you transfer to a different work group on this base if you could, other than for advancement or to change specialty (AFSC)?

The yes-no responses form a dichotomous dependent variable, taking on the values of 1 if the respondent would like to transfer, and 0 if not.

6.1.1 Descriptive Analysis

About 31% of Air Force enlisted men and about 38% of enlisted women would like to transfer to another work group on the same base for reasons other than advancement or to change specialty. Table 6-1 shows how respondents who would transfer are distributed by percent women in the work group and by sex of the respondent. Key observations are:

- Percentages for males are fairly constant at around 30%, regardless of the concentration of women in the group. For groups with more than 30% women the proportion is slightly higher.

- Substantially larger proportions of women want to transfer, particularly as their concentration in the work group rises.

- The mean proportion of Air Force enlisted personnel who want to transfer is about 32%.

TABLE 6-1

INDIVIDUALS WHO WOULD LIKE TO TRANSFER OUT OF THEIR WORK GROUP, BY PERCENT FEMALE (Percentages*)

Percent Female in Work Group (F)	Sex of Respondent Male	Female	Column Average
F = 0	30.0	-	30.0
0 < F < .15	31.0	34.0	31.0
.15 ≤ F < .30	31.0	39.0	32.5
F ≥ .30	32.0	37.5	34.0
COLUMN AVERAGE	30.7	37.5	32.0

*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Table 6-2 shows the distribution of respondents who would like to transfer by both functional area and sex. The table indicates that:

- Males in the Security Police; Supply, Services, and Contracting; Transportation; and Weapons areas show a greater propensity to transfer than those in other areas.
- Females show a greater propensity to transfer than males in all functional areas except Security Police. Almost half would like to transfer out of Supply, Services and Contracting, and over 40% out of their work groups in the Communications and Intelligence areas.

TABLE 6-2

INDIVIDUALS WHO WOULD LIKE TO TRANSFER OUT OF THEIR WORK GROUPS, BY FUNCTIONAL AREA (Percentages*)

Functional Area	Sex of Respondent Male	 Female	Row Average
Civil Engineering	25.5	39.0	27.6
Comptroller	23.4	33.1	28.2
Depot Ops. & Maint.	31.9	35.7	32.6
Grd.Comm., Elec.Ops. & Maint.	24.1	41.0	29.1
Intelligence	22.5	40.2	31.1
Medical	22.2	28.0	25.1
Operations-Flight	23.5	35.7	26.5
Manpower & Personnel	27.9	33.1	30.2
Research & Development	25.4	31.3	26.9
Security Police	40.9	37.9	40.7
Supply, Services, & Contracting	38.6	48.1	42.9
Training	23.5	28.0	24.7
Transportation	33.7	34.7	33.9
Weapons Sys. Maint.	32.4	38.0	33.2
Admin., Command, & Other	28.3	36.8	31.9
Column Average	30.5	37.2	32.0

*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

The cross-tabulations show that larger proportions of women than men would transfer out of their work groups if given the opportunity. This gender difference shows up across both functional area and concentration of women in the work group, but -- with the exceptions noted above -- does not vary substantially across either functional area or concentration of women within specific gender categories. The conclusion is that although there is a gender difference in desire to transfer from one's work group, this difference does not appear to be related to functional area or concentration of women in the group.

6.1.2 Multivariate Analysis

Multivariate analysis estimates the quantitative relationships between the dependent variable and each independent variable, while simultaneously controlling for the influence of other factors. In this analysis, various group and individual characteristics are controlled for in estimating the independent effects of women on group commitment. The final models are shown in Table 6-3. Model 2 is identical to Model 1 except for the inclusion of the supervisor quality index.

Key Characteristics. Model 1 in Table 6-3 shows that female respondent and percent female in group are significantly and positively related to desire to transfer, both at the 5% level of significance. Key observations are:

- **Gender** -- Enlisted women are about 6.9 percentage points more likely (than enlisted men) to want to transfer out of the work group, other factors held constant;
- **Percent Female** -- The higher the concentration of women in the group, the more likely an individual is to want to transfer. The coefficient for this variable in Table 6-3 represents the change in the desire to transfer resulting

from variations in the concentration of women. For example, if the proportion of women in a certain group were doubled, from 11% to 22%, the model predicts that individuals would subsequently be about 1.2 percentage points more likely to transfer. Although the magnitude of this change is not large in an absolute sense, it may be important in relation to the finding that about 32% of the survey respondents would transfer if they could.

- **Functional Area** -- All significant functional area variables are negatively related to desire to transfer compared to the reference group of Supply, Services, and Contracting. These variables are: Comptroller, Intelligence, Medical, Operations, Manpower and Personnel, and Training.

Key independent variables that are not significant are female respondent-percent female interaction, sex of supervisor, and group size. In these cases, insignificance itself may be an important finding. The first suggests that a group's gender mix does not affect the commitment of men and women differently, other things held equal. The second suggests that neither men nor women are "turned-off" by female supervisors. Taken together, these two findings bode well for increasing the number of women in work groups, at least in terms of its effect on commitment. The last insignificant variable suggests that there is no apparent size effect on commitment to the work group, although group size does play a significant role in some of the other analysis areas.

Group Characteristics. Significant positively related group characteristics are: the work environment index, very stressful and somewhat stressful jobs, very slow paced jobs, equipment and personnel shortages, and a high concentration of E1-3 personnel.

These findings may be used to construct profiles of desirable and undesirable groups and estimate changes in the probability of an individual's desire to transfer from each. For example, an individual whose group has a high-stress job and also regularly experiences equipment shortages is about 23 percentage points more likely to want to transfer than if the job were neither fast nor slow and the group did not regularly experience equipment shortages. The predominant factor in this case is the high-stress job (18 percentage points difference) but the additional 4.5 percentage points added by the shortages exacerbate the potential effect. A similar effect, though not of the same magnitude, might occur in a group whose job is slow-paced and also subject to shortages. In both examples, job stress and pace may be inherent in the mission and thus, to some extent, uncontrollable. However, it may be possible to manipulate other group and individual factors in the profile and thus maximize commitment to the work group.

Individual Characteristics. Enlisted personnel married to military spouses, with no dependents, are significantly more likely to want to transfer compared to single members.

Supervisor Quality Index. The supervisor quality index is added to the regression equation in the second model in Table 6-3. As the table shows, there is a negative correlation between supervisor quality and desire to transfer: the higher the quality, the less likely the respondent is to want to transfer. Although this is a strong relationship, supervisor quality is endogenous in Model 2 and thus causality should not be inferred from these results. None of the key or control variables gained or lost significance with the addition of the supervisor quality index, nor did the significant variables change substantially in magnitude.

TABLE 6-3

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO TRANSFER OUT OF WORK GROUP
(Other Than for Advancement or a Change of Specialty)

	Model 1		Model 2	
Variable Name	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.1609	5.78**	.6892	20.39**
KEY CHARACTERISTICS				
FEMALE RESPONDENT (Male)	.0692	3.19*	.0590	2.81*
PERCENT FEMALE IN GROUP	.0988	3.05*	.0996	3.17*
GROUP SIZE	.0011	2.30	.0001	2.18
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	-.0782	-1.53	-.0856	-1.73
FEMALE SUPERVISOR (Male)	-.0042	- .24	-.0076	- .44
SUPERVISOR QUALITY INDEX			-.1419	-26.02**
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	-.1003	-4.21**	-.1035	-4.48**
Comptroller	-.0970	-2.91*	-.1026	-3.18*
Depot Ops. & Maint.	-.0642	-1.66	-.0588	-1.57
Grd. Comm., Elec. Ops. & Maint.	-.0528	-2.13	-.0523	-2.18
Intelligence	-.0913	-2.69*	-.0962	-2.93*
Medical	-.1143	-3.95**	-.1046	-3.73**
Operations-Flight	-.0984	-3.79**	-.0809	-3.21*
Manpower & Personnel	-.0899	-2.89*	-.0827	-2.74*
Security Police	-.0190	- .73	.0074	.29
Training	-.0711	-2.53*	-.0697	-2.55*
Transportation	-.0466	-1.73	-.0409	-1.57
Weapons Sys. Maint.	-.0298	-1.47	-.0227	-1.16
R&D, Admin., Command, & Other	-.0546	-2.40	-.0491	-2.23

(continued)

TABLE 6-3

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO TRANSFER OUT OF WORK GROUP
(Other Than for Advancement or a Change of Specialty)

Variable Name	Model 1		Model 2	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
GROUP CHARACTERISTICS				
PHYSICAL STRENGTH (Strength Required & Dirt Work)	-.0019	- .41	.0010	.23
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0509	3.39**	.0433	2.98*
JOB STRESS (Not Very Stressful)				
Very stressful	.1854	12.19**	.1516	10.23**
Somewhat stressful	.0636	5.59**	.0458	4.15**
Not at all stressful	.0128	.81	.0230	1.50
JOB PACE (Neither Fast Nor Slow, Somewhat Slow)				
Very fast pace	-.0369	-2.68*	-.0092	- .69
Somewhat fast pace	-.0581	-5.23**	-.0354	-3.28**
Very slow pace	.1173	7.91**	.0792	5.48**
TYPE OF WORK GROUP				
Changing crew (No)	.0439	2.21	.0342	1.77
Supervisor of supervisors (No)	-.0656	-3.52**	-.0533	-2.94*
"One-deep" person (No)	.0471	1.83	.0356	1.42
ANY SHORTAGES LAST WEEK				
Equipment shortages (None)	.0448	4.68**	.0251	2.70*
Personnel shortages (None)	.0923	9.89**	.0680	7.48**
WORK SCHEDULE (Day Shift)				
Midnight shift	.0308	1.41	.0199	.94
Evening shift	.0108	.69	.0083	.55
Extended or irregular hours	.0399	2.36	.0392	2.39
RANK COMPOSITION				
At Least 1 civilian (None)	-.0219	-2.08	-.0247	-2.41
At Least 1 officer (None)	.0143	1.25	.0204	1.84
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	.0943	4.86**	.0823	4.37**

(continued)

TABLE 6-3

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO TRANSFER OUT OF WORK GROUP (Other Than for Advancement or a Change of Specialty)

	Model 1		Model 2	
Variable Name	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	.1056	8.90**	.1054	9.16**
Hispanic	.0521	2.59*	.0494	2.54*
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.0408	-1.61	-.0447	-1.82
Some college and beyond	-.0010	- .11	-.0068	- .75
RESPONDENT HAS CIVILIAN JOB (No)	.0238	1.56	.0257	1.74
RESPONDENT OWNS HOME (Lives on Base, Rents)	-.0043	- .29	-.0041	- .29
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0142	1.16	.0195	1.63
YOS 8 and beyond	.0024	.19	.0093	.75
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	-.0225	-1.36	-.0242	-1.51
Craftsmen and Services	.0197	.95	.0141	.70
Skilled Technicians	-.0537	-3.24**	-.0519	-3.23**
MARITAL STATUS (Single, w/o children)				
Married, military spouse, w/o children	.0577	2.53*	.0533	2.41
Married, civilian spouse, w/o children	.0125	.90	.0097	.72
Single, w/children	.0125	.47	-.0037	- .14
Married, military spouse, w/children	-.0229	- .81	-.0246	- .90
Married, civilian spouse, w/children	-.0101	- .73	-.0098	- .72
Sample size		10,645		10,645
Mean of the Dependent Variable		.3132		.3132
F-Statistic		17.487		30.578
Adjusted R-Square		.0772		.1326

*Significant at 5% level.
**Significant at 1% level.

6.1.3 Reasons for Wanting to Transfer from the Work Group

As a follow-up to the question regarding desire to transfer, respondents were asked:

27. What is the main reason you would transfer?

A. Don't like supervisor
B. Don't like co-workers
C. Don't like duties, work tasks, that make up the job
D. Don't like the physical conditions of the work
E. Don't like the location of the work
F. Don't like the hours/shift
G. Other reason

Table 6-4 shows the distribution of respondents' reasons for wanting to transfer from the work group. These reasons give insight into the group characteristics that underlie an individual's desire to transfer. The most common reasons for both men and women are:

- Don't like duties, work tasks -- 29.3%
- Don't like supervisor -- 12.1%
- Don't like hours or shift -- 11.3%

TABLE 6-4

REASONS WHY INDIVIDUALS WOULD WANT TO TRANSFER FROM THE WORK GROUP
(Column Percentages*)

Reason for Transferring	Sex of Respondent Male	Female	Row Average
Don't like supervisor	11.6	14.9	12.1
Don't like co-workers	3.7	5.3	4.0
Don't like duties, worktasks	30.2	23.9	29.3
Don't like physical conditions	3.4	3.8	3.4
Don't like location	2.0	2.6	2.0
Don't like hours or shift	11.7	8.5	11.3
Other reasons	37.4	41.1	37.9
Column Total	100.0	100.0	100.0

*Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Women differed somewhat from men in all three categories. Among those who expressed a desire to transfer:

- o 6.3% fewer women than men do not like the duties required by their jobs;
- o 3.3% more women than men do not like their supervisors; and
- o 3.2% fewer women do not like the hours or shift.

More than a third of both males and females selected "Other reasons" for wanting to transfer out of the work group. Although respondents were not given an opportunity in the main survey to elaborate on their responses, data from a follow-up interview conducted with a subset of the survey sample provide some insight into these other reasons for wanting to transfer.

Interviewees who had stated they would like to transfer from the work group were asked to restate their main reason and what it was specifically about the reason that would make them want to transfer. About one-fourth of the males who originally responded "Other reasons" simply restated it without elaboration. Aside from this, they cited the following reasons most frequently (in order of magnitude): the job is not challenging, the supervisor is a poor leader, and the job does not offer enough autonomy. Females are more likely to elaborate on their original reasons than males; less than 5% restate "Other reasons". Females who originally responded "Other reasons" cited the following most frequently (in order of magnitude): the job is not challenging, coworkers are unpleasant to work with, the job does not offer enough autonomy, and the supervisor is a poor leader. Most of the responses to this question are actually expansions of the reasons listed in the survey.

6.1.4 Reasons for Wanting to Stay with the Work Group

Table 6-5 lists the reasons that people want to stay in their work group, as given in personal interviews. A group of 801 individuals were randomly selected to participate in interviews, in addition to the written survey. Of this group, 544 (about 68%) said they would not like to transfer from their current work group. Four reasons account for about 83% of the responses:

- Likes job and people - 25.7%
- Likes job tasks - 25.2%
- Likes people in group - 21.8%
- Likes working conditions - 9.8%

The remaining 17% of the sample is fairly evenly distributed over the remaining categories, with the exception of "Likes supervisor," which accounts for less than 1% of the responses, and "Likes opportunity that the job provides", which accounts for about 1% of the responses.

TABLE 6-5

REASONS FOR WANTING TO STAY WITH WORK GROUP
(Column Percentages*)

Reason for Staying	Sex of Respondent Male	 Female	Row Average
Likes Job Tasks	25.0	26.1	25.2
Likes People in Group	22.1	20.7	21.8
Likes Supervisor	.2	.9	.6
Likes Hours	1.3	4.5	2.8
Likes Working Conditions	10.3	2.7	9.8
Likes New Experience	3.3	2.7	3.2
Likes Opportunity	1.1	.9	1.1
Likes Job and People	24.8	28.8	25.7
Likes Job and Supervisor	1.6	4.5	2.8
Likes People and Supervisor	3.8	5.4	4.2
Other	6.4	2.7	3.1
Column Total	100.0	100.0	100.0

*Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Data Source: Follow-up personal interview conducted with a subset of the Survey of Work Groups sample (801 persons) who stated they would prefer to stay with their work groups (544 persons).

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There are no substantial male-female differences in the most common categories. Slightly more females than males tend to choose the job and the people as the reason for staying in their work group. Key sex differences in the less frequently chosen categories are:

- **Likes working conditions** - 10.3% of the male respondents and 2.7% of the females give this reason for staying with the work group.
- **Likes hours** - 4.5% of the female respondents and 1.3% of the males give this reason for staying.
- **Likes job and supervisor** - 4.5% of the females and 1.3% of the males give this reason for staying with their group.

In conclusion, the key reasons for staying with one's work group are compatible job tasks and co-workers. There are no substantial male-female differences in these categories, nor in any of those chosen less frequently, with the exception of the 7 percentage point difference between males and females in "Likes working conditions". These findings contrast, somewhat, with those in Table 6-4, in which the most common reason for wanting to transfer is the dislike of duties and job tasks. Some consistency is given, however, by the supervisor categories, as only a small number of individuals give "Likes supervisor" or "Don't like supervisor" as the main reason for liking or disliking (respectively) a group. Taken together, these results describe a sorting process whereby workers reveal a desire to stay or leave according to their perceptions of the "fit".

6.2 DESIRE TO LEAVE AIR FORCE BEFORE TERM IS UP

This is a commitment to the Air Force dependent variable based on responses to question 129 of the Survey of Work Groups:

> 129. How do you feel about leaving the Air Force before your term of service is up?
>
> A. Do not want to leave;
> B. Would like to leave if I could before my term of service is up; or
> C. I am taking advantage of an "early out" program.

The dichotomous dependent variable formed from the responses takes on the value of 1 if the respondent would like to leave or is taking advantage of an "early out" program and 0 if not. For ease of exposition, both groups -- those wanting to leave before their term is up (92%) and those taking advantage of an "early out" program (8%) -- will be referred to in this analysis as those "wanting to leave the Air Force early".

Desire to leave the Air Force before completing one's obligation is a "vote with your feet" measure of satisfaction. As with the previous dependent variable, if commitment is related to the presence of women in the Air Force -- in this case represented by the presence of women in the respondent's work group -- or if there are any differences in commitment between men and women, a desire or decision to leave the Air Force may reflect important attitudinal problems. Analysis of commitment to the Air Force, together with the examination of commitment to the work group, increases the usefulness of the individual commitment results as an index of the overall satisfaction of the enlisted individual and its relationship to the presence of women.

The linear probability models used to estimate the desire to leave the Air Force early use the same independent variables as the previous analysis. Similarly, two models are used, one with and one without the supervisor quality index variable. The hypotheses discussed in connection with the previous dependent variable also hold for this one.

6.2.1 Descriptive Analysis

About 22.3% of Air Force enlisted men and 24.2% of enlisted women would either leave the Air Force if given the opportunity or are currently taking advantage of an "early out" program. Table 6-6 shows how the proportion of enlisted personnel who would like to leave early are distributed by percent women in the group and by sex of the respondent. Key observations are:

- In all categories (except groups that have no women) women seem more likely than men to want to leave the Air Force early.
- There is a slight difference in the likelihood of wanting to leave early between men and women in mixed groups.
- Proportions of women wanting to leave early are inversely related to the percent women in the group.
- Men in work groups with more than 15% women are less likely to want to leave than those in groups with no women.
- Women in groups with more than 30% women are 7 percentage points less likely to want to leave the Air Force than women in groups with 15% or fewer women.

TABLE 6-6

INDIVIDUALS WHO WOULD LIKE TO LEAVE AIR FORCE BEFORE TERM IS UP, BY PERCENT FEMALE (Percentages*)

Percent Female in Work Group (F)	Sex of Respondent Male	Female	Row Average
F = 0	22.2	-	22.2
0 < F < .15	24.0	29.1	24.7
.15 ≤ F < .30	20.7	24.5	21.5
F ≥ .30	20.6	22.1	21.1
Column Average	22.3	24.2	22.5

*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Table 6-7 shows the distribution of enlisted personnel who would like to leave the Air Force early, by sex and functional area. Proportions of males and females who would like to leave early are about the same, with the exception of the following functional categories:

- Women are about 5.5 percentage points more likely than men to want to leave early if they serve in the Medical, Security or Transportation areas.
- Women are about 14 percentage points more likely than men to want to leave early if they serve in the Operations area.
- Women in the Training area are about 9 percentage points more likely than men to want to leave early.

TABLE 6-7

INDIVIDUALS WHO WOULD LEAVE AIR FORCE BEFORE TERM IS UP, BY FUNCTIONAL AREA
(Percentages*)

Functional Area	Sex of Respondent Male	Female	Row Average
Civil Engineering	22.8	22.1	22.7
Comptroller	17.0	19.5	18.1
Depot Ops. & Maint.	26.2	25.0	26.0
Grd.Comm., Elec.Ops. & Maint.	24.8	25.0	24.8
Intelligence	21.6	23.2	22.2
Medical	19.9	25.4	22.7
Operations-Flight	16.0	29.6	19.9
Manpower & Personnel	18.6	15.8	17.6
Research & Development	23.7	31.3	25.7
Security Police	29.6	34.9	30.0
Supply, Services, & Contracting	21.6	23.4	22.1
Training	17.1	26.0	19.8
Transportation	19.7	25.3	21.1
Weapons Sys. Maint.	22.7	24.0	22.9
Admin., Command, & Other	18.2	22.3	19.9
Column Average	22.1	23.9	22.5

*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

In conclusion, there appear to be some differences between the proportions of males and females who would like to leave the Air Force before their term is up when the responses are examined in terms of functional area and the concentration of women in the work group.

6.2.2 Multivariate Analysis

The final regression models of the desire to leave the Air Force early dependent variable are displayed in Table 6-8, one with and one without the supervisor quality index variable. The principal findings are highlighted below.

Key Characteristics. Table 6-8 shows that all of the key variables are estimated to have an insignificant effect on the probability of wanting to leave the Air Force early. The hypotheses that (1) males and females would differ in regard to desire to leave the Air Force early, (2) the concentration of women in the work group would have an effect on the tendency of males to want to leave early, and (3) the sex of the supervisor would have an effect on an individual's desire to leave early must be rejected. Instead, other factors, included in the model as control variables, are more important determinants of the desire to leave the Air Force early.

TABLE 6-8

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO LEAVE BEFORE TERM OF SERVICE IS UP
(Including Those In An "Early Out" Program)

	Model 1		Model 2	
Variable Name	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.2098	8.34**	.4584	14.70**
KEY CHARACTERISTICS				
FEMALE RESPONDENT (Male)	-.0116	- .59	-.0164	- .85
PERCENT FEMALE IN GROUP	-.0016	- .05	-.0012	- .04
GROUP SIZE	.0009	2.09	.0009	2.01
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	-.0269	- .58	-.0304	- .67
FEMALE SUPERVISOR (Male)	.0042	.26	.0026	.16
SUPERVISOR QUALITY INDEX			-.0668	-13.27**
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	-.0017	- .08	-.0032	- .15
Comptroller	-.0218	- .73	-.0244	- .82
Depot Ops. & Maint.	-.0042	- .12	-.0016	- .05
Grd. Comm., Elec. Ops. & Maint.	.0192	.86	.0194	.87
Intelligence	-.0218	- .71	-.0241	- .80
Medical	-.0322	-1.23	-.0276	-1.07
Operations-Flight	-.0376	-1.60	-.0294	-1.26
Manpower & Personnel	-.0156	- .56	-.0122	- .44
Security Police	.0435	1.85	.0559	2.40
Training	.0285	1.12	.0292	1.16
Transportation	-.0140	- .58	-.0113	- .47
Weapons Sys. Maint.	-.0079	- .43	-.0046	- .25
R&D, Admin., Command, & Other	-.0052	- .26	-.0027	- .13

(continued)

TABLE 6-8

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO LEAVE BEFORE TERM OF SERVICE IS UP
(Including Those In An "Early Out" Program)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
GROUP CHARACTERISTICS				
PHYSICAL STRENGTH (Strength Required & Dirt Work)	-.0032	- .78	-.0019	- .46
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0370	2.73*	.0334	2.49*
JOB STRESS (Not Very Stressful)				
Very stressful	.1163	8.47**	.1003	7.34**
Somewhat stressful	.0481	4.69**	.0397	3.90**
Not at all stressful	-.0059	- .42	-.0012	- .08
JOB PACE (Neither Fast Nor Slow, Somewhat Slow)				
Very fast pace	-.0453	-3.64**	-.0322	-2.60*
Somewhat fast pace	-.0418	-4.17**	-.0312	-3.12*
Very slow pace	.0594	4.44**	.0415	3.11*
TYPE OF WORK GROUP				
Changing crew (No)	.0224	1.25	.0178	1.00
Supervisor of supervisors (No)	-.0273	-1.62	-.0214	-1.28
"One-deep" person (No)	.0047	.20	-.0007	- .03
ANY SHORTAGES LAST WEEK				
Equipment shortages (None)	.0121	1.40	.0028	.33
Personnel shortages (None)	.0425	5.05**	.0311	3.70**
WORK SCHEDULE (Day Shift)				
Midnight shift	.0527	2.67*	.0476	2.43
Evening shift	.0132	.93	.0120	.86
Extended or irregular hours	.0239	1.57	.0236	1.56
RANK COMPOSITION				
At Least 1 civilian (None)	.0048	.51	.0036	.38
At Least 1 officer (None)	.0047	.46	.0076	.74
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	.0350	2.00	.0293	1.69

(continued)

TABLE 6-8

PROBABILITY THAT INDIVIDUAL WOULD LIKE TO LEAVE BEFORE TERM OF SERVICE IS UP
(Including Those In an "Early Out" Program)

Variable Name	Model 1		Model 2	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.0320	-2.99*	-.0321	-3.03*
Hispanic	-.0119	- .66	-.0132	- .73
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.0215	- .94	-.0233	-1.03
Some college and beyond	.0157	1.84	.0129	1.53
RESPONDENT HAS CIVILIAN JOB (No)	.0577	4.19**	.0586	4.29**
RESPONDENT OWNS HOME (Lives on Base, Rents)	-.0054	- .41	-.0053	- .41
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0433	3.89**	.0457	4.14**
YOS 8 and beyond	-.1067	-9.26**	-.1034	-9.05**
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	-.0060	- .40	-.0068	- .46
Craftsmen and Services	-.0231	-1.24	-.0258	-1.39
Skilled Technicians	.0150	1.00	.0158	1.07
MARITAL STATUS (Single, w/o children)				
Married, military spouse, w/o children	.0043	.21	.0022	.11
Married, civilian spouse, w/o children	-.0715	-5.70**	-.0729	-5.86**
Single, w/children	.0181	.75	.0105	.44
Married, military spouse, w/children	-.0595	-2.33	-.0602	-2.38
Married, civilian spouse, w/children	-.0087	- .69	-.0085	- .68
Sample size		10,645		10,645
Mean of the Dependent Variable		.225		.225
F-Statistic		16.296		19.466
Adjusted R-Square		.0720		.0871

*Significant at 5% level.
**Significant at 1% level.

These findings do not invalidate the conclusions drawn in Tables 6-5 and 6-6. There are differences between males and females in their desire to leave the Air Force early. However, those differences become insignificant when factors other than those related to gender are controlled for. All the coefficients for the functional areas are insignificant as well, meaning that when other sources of variation are held constant, functional area does not significantly add to the model's ability to predict an individual's desire to leave the Air Force early.

Group Characteristics. Significant group characteristics estimated by the regression analysis are:

- **Work Environment Index** - Individuals working in the harshest environment are predicted to be about 4 percentage points more likely than those working in the "best" environment to want to leave the Air Force early.[2]
- **Job Stress** - Individuals with very stressful jobs are about 12 percentage points more likely to want to leave the Air Force early compared to those whose jobs are not very stressful. Somewhat stressful jobs raise the probability by about 5 percentage points.
- **Job Pace** - Consistent with the findings for other dependent variables in this study, fast-paced jobs have a positive effect on commitment to the Air Force. Individuals with very fast-paced and somewhat fast-paced jobs are less likely to want to leave the Air Force early compared to those whose job pace is neither fast nor slow or somewhat slow. On the other hand, very slow-paced jobs lead to about a 6 percentage point greater likelihood of wanting to leave early compared to the reference group.
- **Personnel Shortages** - Individuals whose groups experience personnel shortages have about a 4 percentage point

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[2] The work environment index is defined by whether or not an individual works outdoors, in a hazardous area, or is subject to extreme temperature.

greater likelihood of wanting to leave early than those whose groups are not affected by this problem.

As with the desire to transfer, profiles of groups that may increase an individual's desire to leave the Air Force early can be constructed from these results. In fact, in many cases the same profile may have a similar effect, in both direction and magnitude, for both dependent variables. Using an example similar to that used for the previous dependent variable, an individual whose job is very stressful is about 12 percentage points more likely to want to leave the Air Force. Equipment shortages appear to increase the probability by about 16 percentage points. Again, potentially controllable factors, such as shortages, may be manipulated to offset unfavorable and more difficult-to-control factors as a means of maximizing an individual's commitment to the Air Force.

Individual Characteristics. Significant individual characteristics estimated by the regression analysis are:

- **Respondent Has a Civilian Job** - Respondents who have civilian jobs are about 6 percentage points more likely to want to leave the Air Force early compared with those who do not have civilian jobs.
- **Years of Service** - As expected, individuals who can be considered first-termers, those with less than four years of service, are significantly more likely to want to leave the Air Force early, compared with those with between four and seven years of service. Similarly, career personnel, in this case those with eight or more years of service, are less likely to want to leave early compared with the reference group.
- **Family Status** - Individuals married to civilian spouses and who have no dependents are significantly less likely to want to leave early, compared with the reference group of single individuals with no children. Other family status groups are estimated to have propensities to leave early that are statistically indistinguishable from single persons without children.

Supervisor Quality Index. As expected, the higher the reported quality of the supervisor, the less likely an individual is to want to leave the Air Force early. The magnitude of the coefficient is large: for each unit change in the index, there is about a 7 percentage point change in the likelihood that an individual will want to leave the Air Force early. Given that 22.5% of enlisted personnel report a desire to leave early, this suggests that supervisor quality plays an important role in the context of personnel retention.

The addition of the supervisor quality index in Model 2 has little effect on the statistical significance of the other independent variables. One exception is the set of job pace variables, which are significant at the 1% level in Model 1, but drop to the 5% significance level in model 2, primarily due to the reduction in the magnitude of the estimated coefficients, which drop about a percentage point. This signals an expected correlation between effects of working conditions and supervisor quality.

6.3 EXPECTED CAREER LENGTH

Expected Air Force career length, like the desire to leave the Air Force before one's term is up, measures an individual's commitment to the Air Force. It also provides insight into factors that may affect retention behavior and the YOS composition of the force. Note, however, that expected career length reported by survey respondents more accurately represents desired or planned service than actual career length.

This commitment to the Air Force variable is constructed from questions 144 and 128 in the Survey of Work Groups. Each questionnaire item gives respondents a range of years, partly continuous and partly categorical, from which to choose their responses:

144. How much total active federal military service have you completed?

A. less than 1 year
B. 1 year but less than 2
C. 2 years but less than 3
D. 3 years but less than 4
E. 4 years but less than 5
F. 5 years but less than 6
G. 6 years but less than 7
H. 7 years but less than 8
I. 8 years but less than 9
J. 9 years but less than 10
K. 10 years but less than 15
L. 15 years but less than 20
M. 20 years or more

128. How many more years do you expect to serve on active duty in the Air Force?

A. less than 1 year
B. 1 more year
C. 2 more years
D. 3 more years
E. 4 more years
F. 5 more years
G. 6 to 10 years
H. 11 to 15 years
I. 16 or more years
J. Undecided

Data from these questions are merged in such a way that reported years expected to serve are added to reported current years of service to get a respondent's expected career length. The sum is used as the dependent variable in a series of regression equations. This method is feasible when summing together definite categories from each questionnaire item. A definite integer cannot be inferred, however, from any mathematical operation on an interval.

This problem is partially resolved by assigning each interval the value of its midpoint. This solution is implemented subject to certain a priori assumptions on career decisions derived from retention data. For example, most individuals who stay in the Services for 17 years will stay the 3 more years needed to qualify for retirement benefits. Hence, those whose computed expected career length was 17 years were assumed to have an actual career expectation of 20 years of sevice. Although there is some risk of misrepresenting responses, this method is the best compromise for defining the dependent variable, given the problems with the survey questions.

With one exception, expected career length is specified as a function of the same independent variables as in the previous models. The exception is that female respondent and YOS are replaced with a six-way pattern variable that crosses YOS with sex. The new dichotomous variables are:

- Male, YOS fewer than 4 years,
- Female, YOS fewer than 4 years,
- Male, YOS 4-7 years (reference group omitted from the regression model),
- Female, YOS 4-7 years,
- Male, YOS 8 or more years,
- Female, YOS 8 or more years.

Clearly, a strong tautological relationship exists between expected career length and current years of service. The sex and YOS interaction terms yield insight into how men and women of comparable experience differ in terms of their expected career lengths, and therefore have implications for a changing force structure in response to any increase in the number of women in the Air Force.

6.3.1 Descriptive Analysis

Table 6-9 shows the mean expected career length by sex and by the concentration of women in the work group. Expected career length appears to be independent of both factors: mean expected career length for both males and females is about 11 years,[3] and there are no substantial differences between groups with low concentrations and those with high concentrations of women.

TABLE 6-9

INDIVIDUAL'S EXPECTED CAREER LENGTH, BY PERCENT FEMALE
(Mean Years)

Percent Female in Work Group (F)	Sex of Respondent Male	Female	Row Average
$F = 0$	10.9	-	10.9
$0 < F < .15$	11.1	10.8	11.0
$.15 \leq F < .30$	11.5	11.2	11.5
$F \geq .30$	11.7	11.2	11.5
Column Average	11.1	11.2	11.2

*Years are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Table 6-10 shows mean expected career length by sex and functional area. There appears to be no important sex difference across functional area.

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[3] Median expected career length for both males and females is 10 years.

TABLE 6-10

INDIVIDUAL'S EXPECTED CAREER LENGTH, BY FUNCTIONAL AREA
(Mean Years*)

Functional Area	Sex of Respondent Male	Female	Row Average
Civil Engineering	10.2	11.9	10.3
Comptroller	13.7	12.4	13.3
Depot Ops. & Maint.	10.0	9.4	9.9
Grd.Comm., Elec.Ops.& Maint.	11.5	10.6	11.4
Intelligence	11.0	9.5	10.7
Medical	11.5	11.0	11.3
Operations-Flight	12.5	12.2	12.5
Manpower & Personnel	11.5	11.8	11.6
Research & Development	11.1	14.1	11.7
Security Police	9.7	11.2	9.8
Supply, Services, & Contracting	11.0	10.0	10.8
Training	12.8	12.7	12.8
Transportation	11.6	10.5	11.4
Weapons Sys. Maint.	11.1	11.3	11.1
Admin., Command, & Other	12.2	11.8	12.1
Column Average	11.2	11.1	11.2

*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

6.3.2 Multivariate Analysis

The final models for expected career length are shown in Table 6-11. As with previous tables, Model 2 contains the same independent variables as Model 1, but also includes the supervisor quality index. The coefficients in this table show how many years each factor is estimated to contribute to an individual's expected career length, while the effects of all other factors are held constant.

Key Characteristics. Percent female, group size, female respondent-percent female, and female supervisor are found to be insignificant predictors of expected career length. The hypothesis that these factors are important determinants of career length is rejected. Thus, gender-related factors play an insignificant role in commitment to the Air Force, whether viewed from expected career length or desire to leave the Air Force early.

In previous models, female respondent also tested insignificant, but when crossed with YOS it yields interesting results:

- There is no substantial difference between males and females with fewer than four years of service. Both have expected career lengths about seven years shorter than males with between four and seven years of service. This may reflect the lower retention rate of first-term enlisted personnel.
- Females with four to seven years of service have expected career lengths about a year shorter than their male counterparts. Although the magnitude of the difference is not substantial, this finding is significant and does indicate a slight male-female difference.
- The largest difference is between males and females with eight or more years of service. Males in this category have an estimated expected career length of about five

years longer than the reference group. This is not surprising, since most of the personnel with eight or more years probably intend to make the Air Force a career. Women in the same YOS category, however, have an expected career length about three years longer than the reference group, or two years less than males with 8 or more years of service While the magnitude of the split is not substantial, it is significant and does reveal a sex difference. It presages a potential effect on the ability of the Air Force to meet its end strength objectives if the male-female composition is altered substantially.

Group Characteristics. Group factors are estimated to have little significant effect on expected career length. The significant variables include:

- **Type of Work Group** - Those who supervise other supervisors expect to be in the Air Force about a year longer than individuals in stable teams.
- **Work Schedule** - Individuals who work on the midnight shift expect to be in the Air Force about a year less than those who work on the day shift. Those in other shifts show no significant deviation from the reference group.
- **Relative Experience Index** - The higher the ratio of E1-3 to all enlisted in a group, the shorter is an individual's predicted Air Force career.

Individual Characteristics. With the exception of marital status, the analysis finds that few individual factors appear to have a significant effect on an individual's expected career length. Significant marital status variables are: married to civilian spouse, no children; married to civilian spouse, children; and married to military spouse, children. In all three factors, the magnitude of the effect is not substantial -- each individual expects to be in the Air Force about 1 year longer than single individuals with no children.

TABLE 6-11

INDIVIDUAL'S EXPECTED CAREER LENGTH
(Years of Service)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
INTERCEPT TERM	16.7219	43.30**	14.7518	30.58**
KEY CHARACTERISTICS				
PERCENT FEMALE IN GROUP	-.3496	- .75	-.3490	- .75
GROUP SIZE	-.0155	-2.32	-.0155	-2.32
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	-.0073	- .01	.0269	.04
YOS BY SEX (Male, YOS 4-7)				
Male, YOS < 4 years	-6.4569	-33.62**	-6.4790	-33.82**
Female, YOS < 4 years	-7.1021	-18.22**	-7.0717	-18.19**
Female, YOS 4-7 years	-1.1961	-2.92*	1.1756	2.88*
Male, YOS 8 > years	5.0972	28.14**	5.0841	28.15**
Female, YOS 8 > years	2.9969	6.09**	3.0365	6.19**
FEMALE SUPERVISOR (Male)	.3993	1.59	.4262	1.70
SUPERVISOR QUALITY INDEX			.5295	6.78**
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	-.3867	-1.19	-.3672	-1.13
Comptroller	-.3342	- .73	-.3291	- .72
Depot Ops. & Maint.	.3163	.58	.2996	.55
Grd.Comm., Elec.Ops. & Maint.	-.6251	-2.11	-.6303	-2.13
Intelligence	-.6138	-1.42	-.5944	-1.38
Medical	.1865	.54	.1434	.42
Operations-Flight	.6989	2.05	.6385	1.88
Manpower & Personnel	.4001	.94	.3701	.87
Security Police	-.8049	-2.51*	-.8853	-2.77*
Training	-.1681	- .45	-.1597	- .43
Transportation	.3472	.94	.3086	.83
Weapons Sys. Maint.	-.1999	- .84	-.2278	- .96
R&D, Admin., Command, & Other	.4790	1.55	.4724	1.53

(continued)

TABLE 6-11

INDIVIDUAL'S EXPECTED CAREER LENGTH
(Years of Service)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
GROUP CHARACTERISTICS				
PHYSICAL INDEX (Strength Required & Dirty Work)	.0807	1.30	.0685	1.11
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	-.3139	-1.49	-.2804	-1.34
JOB STRESS (Not Very Stressful)				
Very stressful	-.3279	-1.54	-.2256	-1.06
Somewhat stressful	-.0941	- .58	-.0387	- .24
Not at all stressful	.0202	.09	-.0146	- .07
JOB PACE (Neither Fast Nor Slow, Somewhat Slow)				
Very fast pace	.2127	1.11	.1233	.64
Somewhat fast pace	.3082	1.96	.2256	1.44
Very slow pace	-.3245	-1.54	-.1915	- .91
TYPE OF WORK GROUP				
Changing crew (No)	-.5376	-1.90	-.5001	-1.77
Supervisor of supervisors (No)	1.2608	5.27**	1.2283	5.15**
"One-deep" person (No)	.4401	1.26	.4821	1.38
ANY SHORTAGES LAST WEEK				
Equipment shortages (No)	-.0219	- .16	.0627	.46
Personnel shortages (No)	-.3124	-2.37	-.2263	-1.72
WORK SCHEDULE (Day Shift)				
Midnight shift	-1.1498	-3.65**	-1.0931	-3.48**
Evening shift	-.0342	- .15	-.0191	- .09
Extended or irregular hours	-.2518	-1.07	-.2462	-1.05
RANK COMPOSITION				
At Least 1 civilian (None)	.0956	.64	.1036	.69
At Least 1 officer (None)	.1542	.98	.1426	.91
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	-.7069	-2.61*	-.6411	-2.37

(continued)

TABLE 6-11

INDIVIDUAL'S EXPECTED CAREER LENGTH
(Years of Service)

Variable Name	Model 1		Model 2	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.2418	-1.47	-.2408	-1.47
Hispanic	-.4079	-1.47	-.3960	-1.43
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.2505	- .73	-.2286	- .67
Some college and beyond	.0014	.01	.0186	.14
RESPONDENT HAS CIVILIAN JOB (No)	-.3726	-1.77	-.3850	-1.83
RESPONDENT OWNS HOME (Lives on Base, Rents)	.5970	3.02*	.5914	2.99*
MARITAL STATUS (Single, w/o Children)				
Married, military spouse, w/o children	-.1804	- .55	-.1854	- .56
Married, civilian spouse, w/o children	.8707	4.38**	.8596	4.34**
Single, w/children	.7154	1.94	.7616	2.07
Married, military spouse, w/children	1.4042	3.49**	1.4225	3.55**
Married, civilian spouse, w/children	.8681	4.49**	.8769	4.54**
Sample size	8,352		8,352	
Mean of the Dependent Variable	11.1		11.1	
F-Statistic	173.856		172.413	
Adjusted R-Square	.5231		.5257	

*Significant at 5% level.
**Significant at 1% level.

Supervisor Quality Index. The supervisor quality index has little effect on the magnitude of the previously significant coefficients. It is significant itself, however, and the coefficient is of sufficient magnitude that supervisor quality appears to have a moderate effect on changes in an individual's expected career length. For each unit change in the index (on a 5-point scale), the model predicts a six-month change in an individual's expected career length. In this case, raising supervisor quality may contribute to lengthening an individual's career and thus have a positive effect on retention behavior.

6.4 SUMMARY

Desire to Transfer to Another Work Group. About 31% of Air Force enlisted men and 38% of enlisted women would like to transfer to another work group for reasons other than advancement or to change specialty. Tabular analysis shows that although larger proportions of women than men seem to want to transfer, this difference is not related to functional area or concentration of women in the group.

Multivariate analysis finds the following in regard to the key characteristics:

- **Male-Female Difference** - Women are more likely than men to want to transfer out of their current work group, even after controlling for the effects of other factors. This difference has potential implications for skill migration and force stability.
- **Percent Female in Group** - The higher the concentration of women in the group, the more likely an individual -- male or female -- is to want to transfer.

- **Female Respondent-Percent Female Interaction** - Males and females do not differ significantly in their reactions to the effect of the concentration of women in the work group.
- **Female Supervisor** - Sex of the supervisor is not a significant factor in an individual's desire to transfer from the work group.
- **Group Size** - Group size is not a significant predictor of an individual's desire to transfer.

As expected, stressful jobs result in a greater propensity, and fast-paced jobs in a lesser propensity, to want to transfer. Equipment and personnel shortages make an individual more likely to want to transfer out of his or her work group. Enlisted personnel with military spouses and no children are significantly more likely to want to transfer. The analysis finds that the higher the reported supervisor's quality, the less likely an individual is to want to transfer out of the work group.

The most common reasons for wanting to transfer from the work group are dislike of duties, supervisor, and work schedule. Male-female differences are not substantial. About a third of the respondents gave "Other reasons" without elaborating. In a follow-up interview, a subset of the original sample was asked to restate and then elaborate on the one main reason they gave for wanting to transfer out of their group. The most frequent responses for those who originally cited "Other reasons" are: job is not challenging, supervisor is a poor leader, and job does not offer enough autonomy. Women, but not men, also said coworkers are unpleasant to work with. The most common reasons individuals give for wanting to stay with the work group are that they like the job tasks and the people in the group. Again, both those who would prefer to stay and those who would prefer to leave tend to cite the same reasons, suggesting that individuals reveal a desire to stay or leave according to their perceptions of the "fit."

Desire to Leave the Air Force Before Term is Up. About 22.3% of Air Force enlisted men and 24.2% of enlisted women would either leave the Air Force if given the opportunity, or are currently taking advantage of an "early out" program.

Multivariate analysis finds that gender-related factors are insignificant predictors of an individual's desire to leave the Air Force early when the effects of other personal and group characteristics are controlled for. Factors found to significantly increase an individual's desire to leave the Air Force early are: harsh work environment, job stress, personnel shortages, and respondent has a civilian job. Job pace and supervisor quality appear to significantly decrease the desire to leave early.

Expected Career Length. Based on the constructed dependent variable, the mean expected career length for Air Force enlisted personnel is about 11 years. Tabular analysis shows that expected career length appears to be independent of sex, concentration of women in the work group, and functional area.

Multivariate analysis finds that the percent female in a group, group size, female respondent-percent female interaction, and sex of supervisor are insignificant factors in estimating expected career length. Group and individual variables also show little significant effect on expected career length. There is no substantial difference between males and females with fewer than four years of service nor between those with four to seven years of service. However, males with eight or more years of service have an expected career length about two years longer than females with the same experience. The supervisor quality index is significant and is associated with the length of an individual's expected career.

7. INDIVIDUAL PERFORMANCE

This chapter examines three indicators of individual performance and availability measured by the Survey of Work Groups:

- Ability to respond quickly in the event of deployment or mobilization;
- Availability for temporary duty (TDY); and
- Lost work time during the past week.

The analysis estimates the relationships between these indicators of individual performance and the key characteristics of gender, the proportion of females in a work group, group size, supervisor quality, and the group's functional area. A wide variety of other personal and group factors are controlled for in the multivariate analysis to obtain unbiased estimates of the effects of the key variables on individual performance and availability.

Discussion of the results is organized into three parts. First, each dependent variable is defined and important caveats are noted. Second, descriptive statistics show how each dependent variable is distributed by sex of the respondent, percent women in the work group, and functional area. Finally, the multivariate results are presented and discussed. Where relevant, tables of the reasons for individuals' behavior are presented by gender.

7.1 INDIVIDUAL MOBILITY

The ability of an individual to deploy quickly is the micro counterpart to overall Air Force readiness. The dependent variable, hereafter referred to as individual mobility, is based on Question 47:

> 47. In the event of deployment or mobilization, would you personally be able to respond quickly?

Individuals answering "yes" to this question were assigned a value of 1 for the dependent variable; those answering "no" were given a value of 0. It is important to emphasize that this question does not constitute a formal measure of Air Force readiness, nor does it capture the quality or timeliness of individual responses to deployment. Rather, it represents a self-reported ability to respond quickly to these events in a way that allows us to:

- Predict and contrast individual mobility for people with a wide variety of demographic and military characteristics; and
- Estimate the determinants of individual mobility as distinct from the mobility of an individual's work group.

7.1.1 Descriptive Analysis

Table 7-1 shows the distribution of individual mobility by sex and percent female in the work group.

TABLE 7-1

INDIVIDUALS REPORTING A QUICK RESPONSE TO DEPLOYMENT BY PERCENT FEMALE AND SEX

(Percentages*)

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
F = 0	93.1	-	93.1
0 < F < .15	92.2	84.3	91.5
.15 ≤ F < .30	91.4	80.4	89.3
F ≥ .30	90.8	82.0	87.5
Column Average	92.4	81.9	91.2

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Slightly over 90% of enlisted personnel report that they could respond quickly if deployed.[1] The degree of responsiveness, however, varies substantially by sex. Table 7-1 shows that 82% of women believe they could deploy quickly, compared to 92% of the men. The multivariate analysis investigates whether this difference is due strictly to gender, or whether it reflects underlying circumstances that may be correlated with sex.

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[1] The 95% confidence interval around this estimate is 90.3% to 92.2%.

There is little correlation between individual mobility and the proportion of females in a work group. Although group characteristics are not expected to be important predictors of individual mobility, the multivariate analysis examines this possibility by including several group factors in the regression equations.

Table 7-2 presents the distribution of individual mobility crossed by functional area and sex. Individual mobility ranges from a high of 94% for those in Operations to a low of just under 86% for Intelligence.[2] Although mobility varies somewhat by functional area, a more important finding is that male-female differences documented in Table 7-1 persist even when controlling for functional area. This suggests that if there is a gender difference, it is not clustered by function.

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[2] This difference is statistically significant at the 1% level.

TABLE 7-2

INDIVIDUALS REPORTING A QUICK RESPONSE TO DEPLOYMENT BY FUNCTIONAL AREA AND SEX
(Percentages*)

Functional Area	Sex of Respondent Male	Female	Row Average
Civil Engineering	94.1	90.9	94.0
Comptroller	88.6	84.2	87.5
Depot Ops. & Maint.	89.0	92.7	89.3
Grd.Comm., Elec.Ops. & Maint.	89.4	81.5	88.5
Intelligence	87.6	77.8	85.7
Medical	88.6	78.6	85.8
Operations-Flight	95.2	84.3	94.2
Manpower & Personnel	93.3	87.7	92.0
Research & Development	88.1	87.9	88.0
Security Police	95.1	79.2	94.5
Supply, Services & Contracting	92.3	81.5	90.4
Training	87.9	82.8	87.2
Transportation	92.3	82.9	91.2
Weapons Sys. Maint.	93.0	81.9	92.3
Admin., Command, & other	93.4	80.7	90.6
Column Average	92.3	82.1	91.2

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

7.1.2 Multivariate Analysis

Tables 7-1 and 7-2 suggest that individual mobility is lower for females than for males. This hypothesis is tested with a multivariate linear probability model, holding constant the effects of other factors. Table 7-3 presents the estimated coefficients and associated t-ratios for the final specification of the individual mobility model. Findings for the characteristics of key interest to the study are presented first, followed by the results for other group and individual factors. However, because only a single group of sex interaction terms is included in any one model specification, Table 7-3 does not present a number of other important results. Therefore, before proceeding to a discussion of Table 7-3, results of alternate sex interaction specifications are presented and discussed.

Family Status. Tabular analysis of the correlates of individual mobility find that females are less likely to deploy quickly than males. A more complete model of the determinants of individual mobility, however, should consider an individual's family status. Whether or not a person is married or has responsibility for dependents could inhibit mobility.

The analysis tests this hypothesis by introducing a 6-way marital-dependent status pattern variable into the multivariate model.[3] The regression findings for this specification are presented below (the omitted reference group is noted in parentheses). Unless otherwise noted, the estimated effects and significance of other exogenous variables in alternate model specifications are largely the same as for the final model presented in Table 7-3. For the sake of brevity, complete results are not presented for each model specification.

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[3] A pattern variable is a construct that facilitates testing the effect of particular combinations of variables without having to solve for the significance of the joint effect of two or more estimated coefficients.

PROBABILITY OF AN INDIVIDUAL DEPLOYING QUICKLY
(Specification 1)

Variable	Estimated Coefficient	t-Ratio
FEMALE RESPONDENT (Male)	-.0756	-7.55**
FAMILY STATUS (Single,[a] no children)		
Military spouse, no children	-.0066	-0.47
Civilian spouse, no children	-.0458	-5.34**
Single, w/children	-.1521	-9.25**
Military spouse, w/children	-.0609	-3.93**
Civilian spouse, w/children	.0114	1.33

**Significant at the 1% level.

[a] Single includes separated, widowed, and divorced. Unreported regressions estimated very similar coefficients for these individuals as well as single, never-married persons. These groups were combined by the analysis to maintain sample cell size.

The above results show that females are 7.5 percentage points less likely than males to deploy quickly, other things held constant.[4] Moreover, the estimates reveal that single parents are 15 percentage points less likely to respond quickly than single people without children. Members with a civilian spouse are 4.6 percentage points, while those with a military spouse and children are 6 percentage points, less likely to deploy quickly compared to childless single persons (the reference group).

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[4] This finding is consistent with the results of Chapter 8 that show a decline in group mobility as the proportion of females in the group increases.

These findings suggest that while females have a lower response rate than males, family status plays a critical role in explaining this disparity. Specification 1 raises two questions concerning the relationship between individual mobility and family status:

- Are marital status and dependent care responsibilities a more important factor in predicting individual mobility than gender alone?
- Are the effects of marital status and dependent care different for women than for men?

The above model specification is not very useful for answering these questions because it does not permit the family status effects to vary by a member's sex. The final specification, presented in Table 7-3, provides a clearer measure of these effects by introducing a 12-way sex-marital-dependent status pattern variable.

Pregnancy. A hypothesis concerning the correlates of individual mobility is that pregnancy limits an individual's flexibility for deployment. The analysis tests this conjecture in two ways. First, a pregnancy in the family may affect mobility regardless of whether the member or the spouse is pregnant. A dummy variable to capture this effect was found to have an insignificant effect (see Table 7-3).

A second hypothesis is that a female member's pregnancy may reduce mobility much more than the pregnancy of a male member's spouse. This possibility is tested by crossing the sex of respondent with family pregnancy. The key results of this interaction are presented below.

PROBABILITY OF AN INDIVIDUAL DEPLOYING QUICKLY
(Specification 2)

Variable	Estimated Coefficient	t-Ratio
SEX x FAMILY PREGNANCY (Male, spouse not pregnant)		
Female, not pregnant	-.0664	-6.49**
Female, pregnant	-.1408	-4.51**
Male, spouse pregnant	-.0005	- .04

**Significant at the 1% level.

The above specification finds that a pregnant spouse does not have a significant effect on a male member's mobility. However, a pregnant female member is estimated to be 14.1 percentage points less likely to deploy quickly than a male, and 7.4 percentage points less likely than a female who is not pregnant (-.1408 + .0664).[5]

Years of Service. The final model specification presented in Table 7-3 indicates a significant years of service (YOS) effect on individual mobility. Specifically, persons below YOS 4 are 3.1 percentage points less likely to deploy quickly than individuals at YOS 4-7. Persons at YOS 8 and above are 2.2 percentage points more likely to respond quickly than the omitted group. Because this YOS effect may be different for women than for men, the following model interacts sex with YOS to create a 6-way pattern variable.

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[5] This finding is consistent with Air Force policy that does not permit pregnant women to be assigned to mobility positions.

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PROBABILITY OF AN INDIVIDUAL DEPLOYING QUICKLY
(Specification 3)

Variable	Estimated Coefficient	t-Ratio
SEX x YOS (Male, YOS 4-7)		
Male, YOS < 4	-.0306	-3.83**
Male, YOS ≥ 8	.0220	2.74*
Female, YOS < 4	-.1067	-7.70**
Female, YOS 4-7	-.0829	-5.04**
Female, YOS ≥ 8	-.0392	-1.83

*Significant at the 5% level.
**Significant at the 1% level.

The findings suggest that both men and women are more likely to respond quickly in the event of deployment as YOS increases. However, this trend is not as pronounced for females as it is for males. While both men and women below YOS 4 appear less able to deploy quickly than the reference group, only after women have accumulated at least eight years of experience do they report the same degree of mobility as males at YOS 4-7.

Key Characteristics. The regression analysis indicates that only two key characteristics of the study are significant predictors of individual mobility[6]: (a) supervisor quality, and (b) some gender interactions. The significance of supervisor quality is somewhat difficult to explain because it is typically considered a group characteristic, and group characteristics, consistent with a priori expectations, are generally insignificant determinants of individual mobility. A unit increase in the 5-point supervisor quality index is associated with a 3.2 percentage point increase in the probability of deploying quickly. The explanation for this estimated measure of association may be the "halo effect" cited in Chapter 5.[7]

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[6] The analysis also finds that individuals in the functional area of Training are less likely to be able to deploy quickly than persons in other functional areas after controlling for other factors.

Although previous specifications found that females have a different effect with respect to pregnancy and YOS, the most important influence on an individual's ability to deploy may be the interdependent effects of gender, marital status, and care for dependent children. Table 7-3 shows that all combinations of these factors (other than males with a military spouse and no children) significantly lower an individual's ability to deploy quickly relative to single males without children (the reference group). The relationship between these interaction terms and individual mobility can be clustered into four general groups. These groups, in decreasing order of magnitude, are:

- Single females with children;
- Married females with children and Single males with children;
- Married females without children; and
- Single females without children and Married males with or without children.

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[7] The "halo effect" suggests that individuals who feel positively about the performance of their group or themselves also feel positively about their supervisor.

TABLE 7-3

PROBABILITY OF AN INDIVIDUAL RESPONDING QUICKLY TO DEPLOYMENT

Variable Name	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.8336	46.41**
KEY CHARACTERISTICS		
PERCENT FEMALE IN GROUP	.0126	.78
GROUP SIZE	-.0002	- .59
SUPERVISOR QUALITY INDEX	.0316	9.33**
FEMALE SUPERVISOR (Male)	-.0102	- .93
SEX-FAMILY STATUS INTERACTIONS (Male, Single, w/o Children)		
Male, military spouse, w/o children	.0008	.05
Male, civilian spouse, w/o children	-.0440	-4.95**
Female, single, w/o children	-.0453	-3.18*
Female, military spouse, w/o children	-.0827	-4.18**
Female, civilian spouse, w/o children	-.0800	-2.60*
Male, single, w/children	-.1330	-6.67**
Male, military spouse, w/children	-.0445	-2.60*
Male, civilian spouse, w/children	-.0293	-3.88**
Female, single, w/children	-.2517	-9.48**
Female, married military, w/children	-.1808	-9.49**
Female, married civilian, w/children	-.1554	-4.82**
FUNCTIONAL AREA (Supply, Services, Contracting)		
Civil Engineering	.0179	1.24
Comptroller	-.0173	- .84
Depot Ops. & Maint.	-.0049	- .20
Grd. Comm., Elec. Ops. & Maint.	-.0252	-1.67
Intelligence	-.0421	-2.05
Medical	-.0265	-1.53
Operations-Flight	.0156	1.02
Manpower & Personnel	.0271	1.42
Security Police	.0194	1.25
Training	-.0475	-2.79*
Transportation	-.0019	- .11
Weapons Sys. Maint.	-.0039	- .32
R&D,Admin,Command & Other	-.0004	- .03

(continued)

TABLE 7-3

PROBABILITY OF AN INDIVIDUAL RESPONDING QUICKLY TO DEPLOYMENT

Variable Name	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS		
RACE (Nonblack, NonHispanic)		
Black	-.0079	-1.09
Hispanic	-.0115	- .93
EDUCATION (High School, Trade, or Technical School)		
Less than high school, or GED	-.0276	-1.76
Some college and beyond	-.0001	- .02
FAMILY MEMBER PREGNANT (No)	-.0189	-1.67
RESPONDENT HAS CIVILIAN JOB (No)	-.0182	-1.94
YEAR OF SERVICE (YOS 4-7)		
YOS < 4	-.0308	-4.13**
YOS 8 and beyond	.0222	2.93*
AFSC GROUP (Support, Admin.)		
Elec./Mech. Equip. Repair	.0277	2.83*
Craftsmen and Services	.0248	1.96
Skilled Technicians	-.0021	- .21

Sample size	10,838
Mean of the Dependent Variable	.9110
F-Statistic	13.09
Adjusted R-Square	.0417

*Significant at 5% level.
**Significant at 1% level.

Three conclusions can be drawn from the estimated relationships concerning the effects of marital status on individual mobility. First, single parents face a significant disadvantage in their perceived ability to respond quickly to deployment or mobilization. Second, care for dependent children, whether the individual is single or married, reduces individual mobility more for females than for males. Third, married females are less likely to be able to deploy quickly than are married males, regardless of responsibility for dependent child care.[8]

Individual Characteristics. Table 7-3 shows that individual mobility is affected by YOS and AFSC group. Individuals in their first term of service are less able to respond quickly to deployment than persons at YOS 4-7. Persons at YOS 8 and beyond, however, are significantly more likely than the reference group to respond quickly. This YOS effect corresponds to the conventional notion that experience is positively correlated with mobility. Recall that an earlier specification revealed a significant interdependency between gender and YOS. While individual mobility response increases with YOS, it does so at a faster rate for men than for women.

The analysis also finds that individuals classified in the AFSC group of Electrical or Mechanical Equipment Repair are 2.8 percentage points more likely to deploy quickly than the reference AFSC group. Given the general insignificance of functional area as a determinant of individual mobility, the meaning of this AFSC relationship is not clear.

Below are some other exogenous variables that were tested in unreported regressions and found to be insignificant:

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[8] These differences are all significant at the 5% level.

- Time with work group,
- Hours worked on civilian job,
- Group work schedule, and
- Residence on or off base.

In addition, several interaction effects were tested and found to be insignificant:

- Percent female in group x group size,
- Sex x percent female,
- Sex x group size, and
- Sex of respondent x sex of supervisor.

The insignificance of these factors supports the earlier conclusion that, with the available data, group characteristics are not important determinants of individual mobility.

7.1.3 Dependent Care and Mobility Responsiveness

Table 7-4 shows the distribution of reasons related to dependent care among individuals who reported they would be unable to respond quickly in the event of deployment or mobilization. The table is based on Question 48 of the survey:

48. Would arrangements for your dependents hurt your ability to mobilize quickly? (MARK ONE)

    A. Does not apply; I have no responsibility for any dependent care arrangements
    B. Yes, for dependent children
    C. Yes, for other dependents
    D. No

TABLE 7-4

REASONS WHY INDIVIDUALS CANNOT DEPLOY, BY SEX
(Column Percentages*)

Arrangements for Dependents Hurt Ability to Deploy	Sex of Respondent Male	Female	Row Average
Yes, for Children	22.9	41.2	27.2
Yes, for Other Dependents	21.6	3.3	17.3
Subtotal	44.5	44.5	44.5
No, Dependent Arrangements Would Not Hurt Ability**	28.6	18.7	26.3
Not Responsible for Dependents**	26.8	36.8	29.3

*Statistics are calculated for the 8.8% of all enlisted who report they are unable to respond quickly if deployed (7.6% of all males, and 18.1% of all females).

Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**Unreported cross-tabs indicate that some respondents _with_ dependents stated they were not responsible for them; while some respondents _without_ dependents stated that dependent arrangements would not hurt their ability to respond to deployment.

Table 7-4 makes two points concerning individual mobility and dependent care. First, 44% of those unable to respond quickly say it is because of dependent care. This proportion is the same overall for both men and women. However, when dependents are split into children and all other, a large difference emerges. Among males, the responsibility for dependent care is divided evenly between children and other (22.9% versus 21.6%). Females, on the other hand, indicate care for children almost exclusively (41.2% versus 3.3%). It is possible that married men tend to consider their wives as other dependents for whom they would be responsible in the event of deployment.

The survey responses underlying Table 7-4 do not support accurate calculation of the percentage of those with dependents who are unable to deploy quickly and who claim dependent care responsibilities. This is because there is ambiguity in the "No" and "Does not apply ..." responses to question 48. Some resondents without dependents may have selected "No" while others with dependents may have answered "Does not apply" if they believed that such responsibility lay with their spouse.

7.2 AVAILABILITY FOR TEMPORARY DUTY (TDY).

An important force management concern is the availability of personnel who can be assigned temporary duty. Use of TDY provides personnel managers flexibility that is often crucial to the successful completion of a work group's mission.

Questions 123 and 124 of the Survey of Work Groups queried respondents about their availability for TDY:

> 123. Were you unable to go on any TDY in the last six months?
>
> A. I was unable at least once (Go to Q. 124)
> B. It was not a problem (Skip to Q. 125)
>
> (If more than one TDY was missed, answer for the most recent.)

124. Why were you unable to go TDY?
(MARK THE ONE MAIN ANSWER)

A. Was pregnant
B. Wife was pregnant
C. Personal health problems other than pregnancy
D. Dependent care responsibilities
E. Second job
F. To attend school
G. Other reason

Tables 7-5 and 7-6 show, respectively, the distribution of those unable to go TDY by sex and percent female in the work group; and of those unable to go TDY, the reasons by sex. There do not appear to be any significant fluctuations in availability for TDY by sex or by percent women in the work group.

TABLE 7-5

INDIVIDUALS UNABLE TO GO ON TEMPORARY DUTY IN LAST SIX MONTHS, BY PERCENT FEMALE AND SEX (Percentages*)

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
$F = 0$	12.3	-	12.3
$0 < F < .15$	15.0	13.7	14.8
$.15 \leq F < .30$	12.2	14.3	12.6
$F \geq .30$	13.5	13.4	13.4
Column Average	13.1	13.7	13.1

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

TABLE 7-6

REASONS INDIVIDUALS UNABLE TO GO ON TEMPORARY DUTY, BY SEX
(Percentages*)

Reason Why Unable	Sex of Respondent Male	 Female	Row Average
Respondent Pregnant	-	23.5	2.8
Wife Pregnant	8.1	-	7.2
Personal Health (Other than pregnancy)	7.4	7.0	7.3
Dependent Care	4.1	3.6	4.0
Second Job	1.1	1.2	1.1
Attending School	6.2	2.4	5.7
Other	73.1	62.3	71.9

*Statistics are calculated for the 13.1% of the population unable to go on TDY in the last six months (13.1% of the men, and 13.7% of the women). Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

The results in Table 7-6 suggest that over 60% of the women and 70% of the men reported a reason of "other" for their inability to go TDY in the last six months. Most of the unknown "Other" reasons may lie outside the control of individuals (e.g., no funding, need overcome by events, person wanted to go but was not asked). If unavailability for TDY includes these "Other", demand-side causes, then it will be difficult for an individual-based model to isolate its personal correlates. This is because most of the variation in TDY availability would be explained by exogenous factors outside of an individual's control.

The above discussion indicates the potential danger of mixing individuals unable to go TDY because of "demand-side" reasons with those unable for "supply-side", or personal, reasons. If the goal of the survey was to collect data on individual and group behavior, then the questionnaire simply did not partition the reasons for unavailability with enough precision.

Short of discarding availability for TDY as a subject for analysis, there are two approaches that can be taken, given the available data:

(1) Estimate a probability model that attempts to explain the variation in individual availability, regardless of reason. This "unconstrained" model has the advantage of predicting the correlates of the overall probability of going TDY, but runs the aforementioned risk of mixing demand-side with supply-side reasons.

(2) Estimate a probability model to explain the variation in TDY availability for the subset of the sample citing one of the personal reasons in Question 124 (responses A-F). This "constrained" model has the advantage of isolating the individuals for whom TDY availability was related to personal, or supply-side, reasons. However, it forces the analysis to discard cases of unavailability that may have occurred for unknown personal reasons. This tends to slant the results of the regression model toward relationships correlated with the stated reasons of Question 124. Because not all of the reasons cited as "Other" are necessarily demand-side constraints, the estimated parameters from this approach may be misleading. Moreover, this bias would be in favor of characteristics associated with the cited reasons.

Neither of the above approaches is superior in terms of both technical validity and compliance with the stated goals of this report. To afford the reader maximum insight into the correlates of TDY availability, the multivariate analysis estimates both a constrained and an unconstrained model. However, because the objective of the study is to examine the correlates of individual behavior, the discussion concentrates more heavily on the results of the constrained model.

7.2.1 Descriptive Analysis

Table 7-7 shows the distribution by sex and percent female in the work group of individuals unable to go TDY because of family, health, job, or school reasons. This is the dependent variable for the constrained model.

Two things are evident from Table 7-7. First, the proportion of individuals unable to go TDY has, by definition, fallen. Second, in contrast to Table 7-5, there is now a noticeable difference in the availability for TDY by sex. However, there is still no significant variation by percent female.

Table 7-8 depicts the distribution of the constrained dependent variable by gender and functional area. While some variation is evident, the male-female differences within a given functional area remain predominant.

TABLE 7-7

INDIVIDUALS UNABLE TO GO ON TEMPORARY DUTY, BY PERCENT FEMALE AND SEX (CONSTRAINED) (Percentages*)

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
F = 0	3.5	-	3.5
0 < F < .15	4.0	6.2	4.2
.15 ≤ F < .30	2.9	6.8	3.7
F ≥ .30	2.5	4.8	3.3
Column Average	3.4	5.6	3.6

Note: Statistics refer to individuals, as a percent of all enlisted population, who report they were unable to go on TDY because of family, health, job, or school reasons. Those citing "other" reasons are not included.

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

TABLE 7-8

INDIVIDUALS UNABLE TO GO ON TEMPORARY DUTY, BY FUNCTIONAL AREA AND SEX (CONSTRAINED) (Percentages*)

	Sex of Respondent		Row
Functional Area	Male	Female	Average
Civil Engineering	4.4	6.5	4.6
Comptroller	2.0	1.8	1.9
Depot Ops. & Maint.	4.8	8.9	5.1
Grd.Comm., Elec.Ops. & Maint.	3.1	7.1	3.5
Intelligence	1.9	4.2	2.3
Medical	1.6	2.2	1.8
Operations-Flight	4.4	1.0	4.1
Manpower & Personnel	0.6	3.2	1.2
Research & Development	1.8	6.2	2.3
Security Police	2.3	4.0	2.3
Supply, Services, & Contracting	2.3	5.9	2.9
Training	2.3	3.2	2.4
Transportation	5.6	11.6	6.3
Weapons Sys. Maint.	4.2	9.2	4.5
Admin., Command, & other	1.5	5.5	2.4
Column Average	3.4	5.5	3.6

Note: Statistics refer to individuals, as a percent of all enlisted personnel, who report they were unable to go on TDY because of family, health, job, or school reasons. Those citing "other" reasons are not included.

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

7.2.2 Multivariate Analysis

Discussion of the multivariate results follows the organization used for individual mobility in Section 7.1. Because the TDY analysis estimates both a constrained (Model 1) and an unconstrained (Model 2) model, results of each model are presented side-by-side. In general, differences in the estimated effects between the two models confirm *a priori* expectations. Model 1, which constrains the analysis to cases of unavailability for family, health, job, or school reasons, tends to find that gender and family characteristics are significant determinants of TDY unavailability. Model 2, which estimates the determinants of TDY availability for all cases, regardless of reason, tends to predict a significant relationship between the dependent variable and factors beyond the individual's control. This finding is consistent with the assertion that the unconstrained specification (Model 2) confounds the regression analysis by introducing a larger number of demand-side determinants. The complete results of the final two models are presented in Table 7-9.

Before turning to a discussion of the final models, however, it is useful to review the results of alternate model specifications that test different gender interaction terms. This approach will also provide further insight into the differences in estimated effects between the constrained and unconstrained models.[9]

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[9] Unless otherwise noted, the estimated coefficients and associated t-ratios for the non-interaction terms listed in Table 7-9 were approximately the same for all alternate model specifications.

The first model specification examines the effects of sex and family status variables on the probability of being unable to go TDY.

PROBABILITY OF BEING UNAVAILABLE FOR TDY
(Specification 1)

	Model 1		Model 2	
Variable	Estimated Coefficient	t-Ratio	Estimated Coefficient	t-Ratio
FEMALE RESPONDENT (Male)	.0312	4.24**	.0003	.02
FAMILY STATUS (Single, no children)				
Military spouse, no children	-.0061	- .62	-.0275	-1.64
Civilian spouse, no children	.0091	1.51	-.0361	-3.52**
Single, children	.0384	3.32**	.0071	.36
Military spouse, children	.0314	2.57*	-.0045	- .22
Civilian spouse, children	.0111	1.86	.0109	1.06
FAMILY MEMBER PREGNANT (No)	.0303	3.88**	.0122	.91

*Significant at the 5% level.
**Significant at the 1% level.

This specification illustrates the differences between the constrained and unconstrained model definitions. Model 1, constrained to TDY unavailability for personal reasons, finds gender and care for dependent children to be significant model determinants. This finding is consistent with *a priori* expectations and the results of individual mobility. However, when this specification is tested for the unconstrained model, the analysis indicates only one significant finding: individuals with a civilian spouse and no children are more likely to be available for TDY than the reference group, although it is difficult to develop a reasonable explanation for this finding. With respect to Model 1, the above results suggest that greater insight into

TDY availability could be gained from adding sex-family status interaction terms into the model.

Another model specification analyzes the relationship between sex and years of service. Two YOS categorical dummy variables are included in the final specification of the TDY unavailability models (a third, YOS 4-7, is the excluded reference group). The results in Table 7-9 indicate a positive YOS $\geq$ 8 effect for the unconstrained model. However, because the effect of YOS may vary by gender, the following specification interacts sex with YOS.

PROBABILITY OF UNAVAILABILITY FOR TDY
(Specification 2)

Variable	Model 1 Estimated Coefficient	Model 1 t-ratio	Model 2 Estimated Coefficient	Model 2 t-ratio
SEX x YOS (Male, YOS 4-7)				
Male, YOS < 4	.0069	1.20	.0133	1.39
Male, YOS $\geq$ 8	-.0114	-2.04	-.0340	-3.54**
Female, YOS < 4	.0488	4.96**	.0274	1.65
Female, YOS 4-7	.0206	1.79	-.0174	- .89
Female, YOS $\geq$ 8	.0066	.45	-.0457	-1.79

**Significant at the 1% level.

This specification reveals a minor, though different, YOS-sex relationship for both the constrained and unconstrained models. Specification 1 found that when female respondent and YOS were entered separately, the estimated coefficient of .0312 for female respondents was statistically significant, while YOS was estimated to have an indiscernable effect on the likelihood of unavailability. When interacted in Specification 2, however, the two have a significant interdependent effect, but only for females at YOS < 4 and males at YOS ≥ 8. This implies that TDY unavailability for personal reasons is clustered among relatively inexperienced females, other things being equal. For the unconstrained model, the interaction indicates that only males at YOS 8 and beyond are significantly more likely to be available for TDY, rather than all individuals with at least 8 years of experience as indicated in Table 7-9.

Table 7-9 shows that a pregnancy in the family has a significant positive effect on the constrained probability of an individual being unable to go on TDY. Yet the analysis of individual mobility finds that pregnancy has the greatest effect on individual behavior when it is the female member who is pregnant, rather than a male member's spouse. Specification 3 tests this hypothesis by introducing a 4-way sex-family pregnancy pattern variable.

PROBABILITY OF BEING UNAVAILABLE FOR TDY
(Specification 3)

	Model 1		Model 2	
Variable	Estimated Coefficient	t-ratio	Estimated Coefficient	t-ratio
SEX x PREGNANCY (Male, spouse not pregnant)				
Male, spouse pregnant	.0054	.65	-.0095	- .66
Female, not pregnant	.0180	2.50*	-.0110	- .89
Female, pregnant	.2017	9.39**	.1619	4.35**

*Significant at the 5% level.
**Significant at the 1% level.

This specification demonstrates the importance of testing for possible interaction effects. Based on Model 1, the effects of pregnancy can be calculated in two different ways.

- **Additive Model (Specification 1):** The predicted effect on TDY unavailability for a pregnant female member is the sum of the estimated coefficients on Female Respondent and Family Pregnancy:[10] .0312 + .0303 = .0615
- **Interactive Model (Specification 3):** The predicted effect on TDY unavailability for a pregnant female member is found directly from the estimated coefficient on the interaction term: Female, pregnant = .2017

For both the constrained and unconstrained models an additive specification seriously underestimates the effect of pregnancy on a female member's availability for TDY. An additive model would predict a 6.2 percentage point lower probability of availability for personal reasons when, in fact, the difference should be 20 percentage points, other things held constant. Similarly, an additive model would predict no female or family pregnancy effect on TDY unavailability, regardless of the reason, when, in fact, an interactive model predicts pregnant members to be 16.2 percentage points less available for TDY (see Specification 3).

Key Characteristics. Table 7-9 presents the complete results of the final specification for both the constrained and unconstrained TDY models. The constrained model, almost by definition, reveals certain gender-family status combinations as significant predictors of TDY unavailability. Females with dependent children are more likely to be unavailable for TDY, regardless of their marital status. Single male parents also face a higher probability of being unavailable for TDY than the reference group. Finally, being married to a civilian is estimated to increase the probability of TDY unavailability for female respondents.

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[10] Strictly speaking, to determine whether this sum is significantly different from 0 requires computing a new t-ratio based on the variances and covariance of the two estimated parameters.

Key characteristics such as group size, the proportion of females in the work group, and supervisor quality are not significantly related to constrained TDY unavailability. This makes sense because the constrained model focuses only on TDY unavailability due to family, health, job, or school related reasons. However, this is not the case for the unconstrained model. While the model does indicate certain gender-family status interactions as significant determinants of TDY unavailability, it also finds strong predicted relationships between the dependent variable and group size and supervisor quality. In lieu of developing a reasonable set of explanations for these relationships, the results suggest that group size and supervisor quality are strongly correlated with some unobserved determinant of TDY unavailability. The hypothesis is that estimated significant determinants of Model 2 not appearing in Model 1 represent correlates of unobserved demand-side factors related to TDY.

TABLE 7-9

PROBABILITY OF INDIVIDUAL BEING UNAVAILABLE FOR TEMPORARY DUTY (LAST 6 MONTHS)

Variable Name	Model 1: Constrained[a]		Model 2: Unconstrained[b]	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.0236	1.86	.1817	8.46**
KEY CHARACTERISTICS				
PERCENT FEMALE IN GROUP	-.0088	- .71	.0279	1.44
GROUP SIZE	-.0002	- .92	.0010	3.03*
SUPERVISOR QUALITY INDEX	-.0046	-1.91	-.0183	-4.52**
FEMALE SUPERVISOR SEX (Male)	.0025	.32	-.0033	- .25
SEX-FAMILY STATUS INTERACTIONS (Male, Single, w/o Children)				
Male, military spouse, w/o children	-.0136	-1.05	-.0340	-1.56
Male, civilian spouse, w/o children	.0039	.63	-.0421	-3.96**
Female, single, w/o children	.0008	.08	-.0325	-1.91
Female, military spouse, w/o children	.0254	1.83	-.0285	-1.21
Female, civilian spouse, w/o children	.0564	2.65*	-.0093	- .26
Male, single, w/children	.0375	2.66*	.0003	.01
Male, military spouse, w/children	.0044	.37	-.0577	-2.83*
Male, civilian spouse, w/children	.0149	2.81*	-.0304	-3.37**
Female, single, w/children	.0608	3.27**	.0080	.25
Female, married military, w/children	.0735	5.54**	-.0096	- .42
Female, married civilian, w/children	.1012	4.57**	.0114	.30
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	.0048	.47	.0055	.32
Comptroller	-.0161	-1.12	-.0165	- .68
Depot Ops. & Maint.	.0265	1.57	.0298	1.04
Grd. Comm., Elec. Ops. & Maint.	-.0055	- .53	.0025	.14
Intelligence	-.0209	-1.45	-.0013	- .05
Medical	-.0287	-2.35	.0253	1.22
Operations-Flight	.0101	.95	-.0037	- .20
Manpower & Personnel	-.0139	-1.05	-.0162	- .71
Security Police	-.0158	-1.43	.0158	.85
Training	-.0198	-1.67	-.0219	-1.08
Transportation	.0431	3.71**	.0313	1.57
Weapons Sys. Maint.	.0060	.70	.0106	.72
R&D, Admin., Command, & Other	-.0102	-1.07	-.0237	-1.44

(continued)

TABLE 7-9

PROBABILITY OF INDIVIDUAL BEING UNAVIALABLE FOR TEMPORTY DUTY
(LAST 6 MONTHS)

Variable Name	Model 1: Constrained[a] Estimated Coefficient	Model 1: Constrained[a] t - Ratio	Model 2: Unconstrained[b] Estimated Coefficient	Model 2: Unconstrained[b] t - Ratio
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.0069	-1.35	.0199	2.29
Hispanic	.0008	.09	.0290	1.96
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	.0194	1.76	.0283	1.51
Some college and beyond	.0064	1.58	-.0027	- .40
FAMILY MEMBER PREGNANT (No)	.0313	4.01**	.0133	.99
RESPONDENT HAS CIVILIAN JOB (No)	.0136	2.07	.0154	1.37
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0106	2.01	.0187	2.09
YOS 8 and beyond	-.0094	-1.79	-.0306	-3.37**
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	.0164	2.40	.0137	1.17
Craftsmen, Services	.0208	2.33	.0372	2.45*
Skilled Technicians	.0208	2.98*	.0080	.66
Sample size		9,683		10,846
Mean of the Dependent Variable		.0359		.1298
F-Statistic		4.48		5.20
Adjusted R-Square		.0138		.0149

*Significant at 5% level.
**Significant at 1% level.

[a] Unavailable for family, health, job, or school reasons.
[b] Unavailable for all reasons.

Individual Characteristics. Neither group nor individual characteristics appear to be important determinants of TDY unavailability.[11] This is true for both the constrained and the unconstrained model, although each estimates different significant characteristics. The constrained model estimates family pregnancy as a significant positive determinant of TDY unavailability. However, Specification 3 indicates that this is only a significant factor for pregnant members. This group of individuals faces a reduction of close to 20 percentage points in the probability of being available for TDY.

The unconstrained model estimates a significant reduction of 3.1 percentage points in TDY unavailability for individuals at YOS 8 and beyond. The rationale for this result is that substantive experience is correlated with some unobserved determinant of TDY availability. While the source of this correlation is unknown, Specification 2 reveals that this relationship holds only for males at YOS 8 and beyond, rather than all career enlisted personnel. Finally, both Models 1 and 2 display a significant AFSC group effect on TDY unavailability. The unconstrained model finds that Skilled Technicians are 2.1 percentage points more likely to be unavailable than individuals in Administration and Support. The constrained model, on the other hand, shows AFSC group Craftsmen and Services more likely to be unavailable for TDY.

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[11] Unreported regressions tested, and rejected as insignificant, a wide variety of group characteristics for the constrained model, including: work pace, work shift, work environment, personnel and equipment shortages, work stress, and work group demographics.

7.3 MISSED WORK HOURS

This section analyzes individual performance as measured by missed scheduled work hours. Lost work time has a clear and direct effect on work group performance. If the probability of missing work varies systematically with measurable group and individual characteristics, then regression analysis may provide information to improve personnel management.

The Survey of Work Groups used a series of questions to query respondents about missed scheduled work time.

115. How many hours of scheduled work did you miss because of training you received?
116. How many hours of scheduled work did you miss because of other Air Force activities (for example, administrative duties, special functions, details and extra duties)?
117. How many hours of scheduled work did you miss because of your own illness or injury?
118. How many hours of scheduled work did you miss because of your own pregnancy?
119. How many hours of scheduled work did you miss because of family illness or injury, family problems, or dependent/child care?
120. How many hours of scheduled work did you miss because of personal business, physical exercise, or other reasons?

Missed hours were recorded as continuous integers from 0-5 hours, in five-hour categories from 6-39 hours, and truncated at 40 for any missed hours over 40.

7.3.1 Descriptive Analysis

Table 7-10 illustrates the proportion of individuals reporting missed hours of scheduled work by reason and gender. In addition to these percentages, the conditional mean number of hours missed, by reason and sex, is also calculated for those reporting lost work time. (The means presented in Table 7-10 are "conditional" because they represent the mean number of hours missed given that an individual missed some amount of scheduled work.)

The most common reason for missed hours, regardless of gender, is Air Force activities (AF Activities). Missed hours due to Air Force activities such as special functions, details, and extra duties occur because of institutional requirements and not by personal choice. The other major institutional source of missed work is Air Force training. Periodic training is a required activity over which individuals have relatively little control.

The primary objective of the analysis is to examine the effects of increasing the proportion of enlisted females in the Air Force on the incidence of missed scheduled work hours. This implies focusing on the incidence of missed work for personal reasons, or reasons subject to individual choice.

Consistent with this focus, the dependent variable for the analysis is defined as 1 if an individual reported missed hours in response to Questions 117-120 (excluding training and other Air Force activities), and 0 otherwise. An alternative definition of the dependent variable was also tested, based on Questions 115-120 (including training and other Air Force activities). The two models were specified identically to validate a comparison between the estimated coefficients. The results demonstrate that the model based on the broader definition of missed hours is inferior in terms of total explanatory power (R^2), and statistical significance of the independent variables.

Lack of variation in the amount of lost scheduled work hours precluded estimation of a model designed to measure the magnitude of missed hours. Such a procedure is problematic because:

- The relatively small proportion of individuals who report missing any work hours makes the magnitude of missed hours conditional, and
- Proper estimation of such a model -- namely, a model with a clustered dependent variable -- requires a more sophisticated methodological approach than the one employed by this analysis.[12]

On a more pragmatic level, analysis of the types of individuals most likely to miss scheduled work hours is a more interesting analysis topic than number of missed hours because of the small numbers involved.

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[12] An appropriate estimation technique for models with a clustered dependent variable is a variant of the probit maximum likelihood technique commonly referred to as a Tobit model.

TABLE 7-10

REASONS INDIVIDUALS MISSED SCHEDULED WORK HOURS, BY SEX (Percentages*)

Reason for Missed Time Last Week	Sex of Respondent Male	Female	Row Average
Training			
Percent**	19.4	17.5	19.0
Mean (Hours)***	6.6	5.0	
AF Activities			
Percent	38.3	39.2	38.7
Mean	6.1	5.0	
Injury or Illness			
Percent	5.8	9.9	6.2
Mean	9.2	7.2	
Pregnancy			
Percent	0.7	4.4	1.1
Mean	11.7	10.3	
Family Needs			
Percent	7.5	6.1	7.3
Mean	4.7	4.1	
Personal Business			
Percent	21.6	23.8	21.9
Mean	3.0	2.9	

---

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**Percent refers to the proportion of all enlisted personnel reporting any lost work time for the stated reason.

***Mean average is calculated for the subsample of all enlisted reporting lost work time for the stated reason.

Tables 7-11 and 7-12 show, respectively, the proportion of individuals who report any missed work hours (as defined above) by the proportion of females in the work group, functional area, and sex. Table 7-11 suggests a slight increase in the incidence of missed hours among males but not females as the proportion of females in the work group rises. However, the probability of missed hours is consistently higher for females than for males.[13]

TABLE 7-11

INDIVIDUALS MISSING SCHEDULED WORK HOURS, BY PERCENT FEMALE AND SEX (Percentages*)

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
$F = 0$	27.5	-	27.5
$0 < F < .15$	29.9	34.1	30.3
$.15 \leq F < .30$	30.8	36.2	31.8
$F \geq .30$	34.1	35.8	34.7
Column Average	29.3	35.7	30.0

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

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[13] This difference is statistically significant at the 1% level.

While tabular analysis by functional area supports the hypothesis that females are more likely than males to miss scheduled work hours, Table 7-12 points to some notable exceptions. Women and men show no appreciable difference in the probability of missing hours in the Intelligence and Supply, Services, and Contracting functional areas. Men are more likely to miss work hours than women in the Comptroller; Depot Operations and Maintenance; and Administration, Command, and Other functional areas. Whether these differences by functional area represent organizational differences, or whether certain functional areas are heavily correlated with underlying personal and group characteristics, is a question to be answered by the multivariate analysis.

TABLE 7-12

INDIVIDUALS MISSING SCHEDULED WORK HOURS, BY FUNCTIONAL AREA AND SEX (Percentages*)

Functional Area	Sex of Respondent Male	Sex of Respondent Female	Row Average
Civil Engineering	31.8%	42.5	32.4
Comptroller	42.3	38.5	41.3
Depot Ops. & Maint.	38.4	24.1	37.1
Grd.Comm., Elec.Ops. & Maint.	32.8	37.7	33.4
Intelligence	24.6	25.4	24.7
Medical	23.9	27.0	24.8
Operations-Flight	25.9	37.9	27.0
Manpower & Personnel	34.3	41.7	36.1
Research & Development	36.8	50.9	38.5
Security Police	14.1	33.5	14.9
Supply, Services, & Contracting	36.7	36.4	36.7
Training	38.0	39.9	38.2
Transportation	35.0	44.2	36.1
Weapons Sys. Maint.	26.5	36.0	27.1
Admin., Command, & Other	40.7	34.9	39.4
Column Average	29.3	35.6	30.0

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

7.3.2 Multivariate Analysis

The multivariate results for the missed work hours analysis are quite different than those for individual mobility and TDY availability. The majority of significant determinants of missed hours are either group characteristics or differences across functional area and AFSC groups. These results are consistent with the tabular analysis that suggests a functional area effect. However, the multivariate results do not reveal a significant gender effect on the probability of missed hours.

Several specifications of the linear probability model were tested during the analysis in an attempt to isolate key determinants of lost work time. Table 7-13 presents the results of the final model specification. Unlike the results for individual mobility and TDY, alternate model specifications testing the effects of various gender interactions failed to turn up any significant findings.[14] Thus, the discussion focuses exclusively on the results of the final model presented in Table 7-13.

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[14] Alternate interactive tests include Percent Female by Group Size, Sex by YOS, and Sex by Family Pregnancy. Pregnant females were 17.8 percentage points more likely to miss work hours; all other interactions proved insignificant.

TABLE 7-13

PROBABILITY OF AN INDIVIDUAL MISSING SCHEDULED WORK HOURS (LAST WEEK)

Variable Name	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.3916	11.34**
KEY CHARACTERISTICS		
PERCENT FEMALE IN GROUP	.0170	.63
GROUP SIZE	-.0002	- .37
SUPERVISOR QUALITY INDEX	-.0125	-2.20
FEMALE SUPERVISOR SEX (Male)	-.0303	-1.69
SEX INTERACTIONS (Male, Single, w/o Children)		
Male, military spouse, w/o children	.0782	2.65*
Male, civilian spouse, w/o children	.0274	1.90
Female, single, w/o children	.0380	1.64
Female, military spouse, w/o children	.0451	1.40
Female, civilian spouse, w/o children	.0649	1.30
Male, single, w/children	.0914	2.81*
Male, military spouse, w/children	.0138	.50
Male, civilian spouse, w/children	.0578	4.70**
Female, single, w/children	.1838	4.23**
Female, married military, w/children	.0747	2.41*
Female, married civilian, w/children	.0365	.70
FUNCTIONAL AREA (Supply, Services, Contracting)		
Civil Engineering	-.0196	- .82
Comptroller	.0301	.90
Depot Ops. & Maint.	.0231	.59
Grd. Comm., Elec. Ops. & Maint.	.0030	.12
Intelligence	-.1020	-3.00*
Medical	-.1044	-3.59**
Operations-Flight	-.0650	-2.49*
Manpower & Personnel	-.0312	-1.00
Security Police	-.1599	-6.12**
Training	.0050	.18
Transportation	-.0019	- .07
Weapons Sys. Maint.	-.0746	-3.68**
R&D, Admin., Command, & Other	.0057	.25

(continued)

TABLE 7-13

PROBABILITY OF AN INDIVIDUAL MISSING SCHEDULED WORK HOURS (LAST WEEK)

Variable Name	Estimated Coefficient	t - Ratio
GROUP CHARACTERISTICS		
WORK STRESS (Not Very Stressful)		
Very stressful	-.0334	-2.18
Somewhat stressful	.0088	.77
Not at all stressful	-.0030	- .19
WORK PACE (Neither Fast Nor Slow)		
Very fast	-.0664	-4.77**
Somewhat fast	-.0078	- .69
Somewhat or very slow	.0603	4.02**
WORK GROUP TYPE		
Changing crew (No)	-.0347	-1.74
Supervisor of supervisor (No)	-.0117	- .62
"One-deep" (No)	-.0112	- .43
RANK COMPOSITION		
At least 1 civilian (No)	.0243	2.30
At least 1 officer (no)	.0147	1.29
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	-.0945	-4.84**
ENVIRONMENT INDEX (Outdoor & Hazardous & Extreme Temp.)	-.0345	-2.31
PHYSICAL INDEX (Strength Required & Dirty Work)	.0007	.16
ANY SHORTAGES LASK WEEK		
Equipment shortage (No)	.0293	3.03*
Personnel shortage (No)	.0516	5.47**

(continued)

TABLE 7-13

PROBABILITY OF AN INDIVIDUAL MISSING SCHEDULED WORK HOURS (LAST WEEK)

Variable Name	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS		
RACE (Nonblack, NonHispanic)		
Black	.0031	.26
Hispanic	.0207	1.02
EDUCATION (High School, Trade, or Technical School)		
Less than high school, or GED	.0316	1.24
Some college and beyond	.0164	1.73
FAMILY MEMBER PREGNANT (No)	.0297	1.63
RESPONDENT HAS CIVILIAN JOB (No)	.0515	3.37**
YEAR OF SERVICE (YOS 4-7)		
YOS < 4	-.0021	- .17
YOS 8 and beyond	-.0066	- .51
AFSC GROUP (Support, Admin.)		
Elec./Mech. Equip. Repair	-.0407	-2.45*
Craftsmen and Services	-.0546	-2.62*
Skilled Technicians	-.0435	-2.63*

Sample size	10,645
Mean of the Dependent Variable	.3002
F-Statistic	9.63
Adjusted R-Square	.0427

*Significant at 5% level.
**Significant at 1% level.

Key Characteristics. Analysis of missed hours reveals several important relationships with respect to key characteristics. Unlike the regression results for other dependent variables, there is no significant relationship between missed hours and sex of the respondent, proportion of females in the work group, group size, or supervisor quality. Three general conclusions stem from these results:

- Holding family status constant, males and females spend the same amount of scheduled time on the job. However, single parents are still more likely to miss scheduled work than their married counterparts, with single female parents relatively more likely to do so than single male parents.
- The proportion of females in the work group does not affect the probability of missed hours for males or females. This evidence refutes the theory that increasing the proportion of women "turns off" male members of a group, and leads to higher absenteeism.
- Supervisor quality, often a significant and sizable correlate of individual and group performance, is not significantly related to the probability of missed work hours.

Relative to individuals in the functional area of Supply, Services, and Contracting, persons in the following functional areas are significantly less likely to miss scheduled hours: Intelligence; Medical; Operations-Flight; Security Police; and Weapons System Maintenance. These findings, along with the regression results for the group characterisitics, suggest that certain functional areas are correlated with unobserved characteristics that are not measured by the survey, but are significant determinants of missed work hours.

Group Characteristics. The analysis finds that work pace, relative work group experience, and personnel and equipment shortages all significantly affect the probability of an individual missing scheduled work. A very fast work pace reduces the probability of missed hours by 6.6 percentage points relative to a pace that is neither fast nor slow. Similarly, a somewhat or very slow work pace increases the probability of missed work by 6 percentage points relative to the reference group. This result is consistent with the findings of other parts of the analysis that suggest that a slow work pace has a negative effect on individual performance, while a fast pace seems to stimulate performance.

Individuals reporting personnel or equipment shortages are 5.2 and 2.9 percentage points, respectively, more likely to miss scheduled work hours. As asserted earlier in this chapter, personnel and equipment shortages may increase the work load and the level of tension in the work place.

Individual Characteristics. The only two individual factors significantly related to the incidence of missed work hours are having a civilian job, and AFSC group. Persons with a civilian job are 5.2 percentage points more likely to miss scheduled work than individuals without such a commitment. It is unclear whether having a civilian job is a direct cause of missed hours (i.e., one cannot work two jobs simultaneously), or whether it is a proxy of a lower commitment to the Air Force. Finally, the regression analysis indicates that persons in the AFSC Administration and Support Group are more likely to miss scheduled work hours than individuals in all other AFSC groups.

7.4 SUMMARY

This chapter examined the relationships between three indicators of individual performance and availability, and an array of personal and group characteristics. Dependent variables estimated by the regression analysis are:

- Individual mobility;
- Unavailability for TDY
  - for personal reasons (constrained)
  - for all reasons (unconstrained); and
- Missed work hours.

Certain factors were found to have consistently significant effects across all measures of individual performance, while others varied in importance. For example, individual mobility and availability for TDY were expected to be independent of work group characteristics, while an individual's propensity to miss scheduled work hours was expected to be more closely associated with work place characteristics. In general, these hypotheses are supported by the analysis results.

Individual Mobility. Two key characteristics are significantly related to an individual's ability to respond quickly to deployment: supervisor quality and various gender interactions. Supervisor quality and individual mobility, however, are both based on the respondent's subjective self-reported evaluations. Because individuals may associate their availability with the quality of their group's supervisor, this finding should probably be considered a measure of association rather than causation.

Several sex interaction specifications proved to be significant determinants of individual mobility. First, individuals with more years of service appear better able to deploy quickly than otherwise similar persons with less experience. This pattern appears less pronounced for women than men. Second, pregnant female members are 14 percentage points less likely to deploy quickly than males, and 7 percentage points less likely than nonpregnant females. Finally, the interdependent effect of gender, marital status, and care for dependent children has a large and significant influence on individual mobility. Three general conclusions can be drawn from these results:

- Single parents face a significant disadvantage in their ability to respond quickly to deployment;
- Care for dependent children -- whether the parent is single or married -- reduces individual mobility for females more than it does for males; and
- Married females are less likely to deploy quickly than married males, regardless of dependent children.

The regression results show that the interrelationship between gender and family status is a much more powerful predictor of individual mobility than gender alone.

Availability for TDY. The multivariate analysis estimated two separate models for reported unavailability for TDY. Model 1 constrained the analysis to cases of unavailability for family, health, job, or school reasons. This model found gender and family characteristics to be significant determinants of TDY unavailability. Model 2 estimated the determinants of TDY unavailability for all known and unknown reasons. This model did not find significant gender or group determinants of TDY availability.

Family pregnancy was found to significantly reduce availability for TDY. However, when this measure is crossed by sex of the respondent, the regression analysis finds that the negative effect is clustered among pregnant female members. Unlike the results for individual mobility, there is no important YOS trend with respect to TDY availability.

Group size, the proportion of females in the work group, and supervisor quality are insignificantly related to constrained TDY availability. The unconstrained model, however, does estimate a significant effect with respect to group size and supervisor quality.

Significant predictors of TDY unavailability for the constrained model include the following interaction effects:

- Females with dependent children, regardless of marital status, are more likely to be unavailable for TDY than males;
- Single male parents, however, face a higher probability of being unavailable than single males with no children; and
- Females with a civilian spouse tend to be less available for TDY than single males with no children.

Other group and individual characteristics were generally found to be insignificant determinants of TDY availability for both definitions of the dependent variable.

Missed Work Hours. Approximately 30% of all individuals reported missing some scheduled work hours during the past week. Unlike the regression results for the other measures of individual performance, males and females did not differ in terms of the probability of missed hours. Family status, however, does emerge as an important predictor. With respect to other key characteristics:

- Single parents are more likely to miss scheduled work than their married counterparts, especially single female parents;
- The proportion of females in the work group does not affect the probability of missed hours for males or females;
- Supervisor quality and group size, often important correlates of individual and group performance, are not significantly related to the probability of missed hours; and

- Individuals in the functional areas of Intelligence, Medical, Operations-Flight, Security Police, and Weapons System Maintenance are significantly less likely to miss scheduled hours than those in the Supply, Services, and Contracting area.

The analysis finds that a very fast work pace reduces the probability of missed hours, while a somewhat or very slow pace increases missed hours. Equipment and personnel shortages also increase the probability of missed work hours. Both of these results are consistent with findings in the other analysis areas.

Finally, the only significant individual correlates of missed hours are having a civilian job and being in the AFSC Administration and Support group. Persons in both of these groups are more likely to miss scheduled work than the respective reference groups.

8. GROUP PERFORMANCE

This chapter begins by examining several indicators of group performance. Because of the lack of objective measures of performance applicable across all occupational groupings, the analysis will focus on three major indicators of group performance derived from the 1984 Air Force Survey of Work Groups:

- Group mobility, as measured by respondent's estimation of the number of group members who could deploy quickly;
- Group morale, which is composed of the respondent's perceptions of the group's quality, interactions, and handling of deadlines; and
- Occurrence of work around, wherein some member of the group does not carry his or her own weight.

Analysis of each topic includes descriptive statistics on the distribution of the dependent variable and multivariate linear probability models linking the dependent variable to exogenous factors. It is important to remember that while respondents rate their groups according to these performance measures, they were not asked to relate these measures directly to the independent variables. Rather, regression techniques are used to estimate the strength of any relationship between each performance indicator and the characteristics of the respondent and his group.

The key variables of the regression analyses are: the gender of the respondent, the percent female in the work group, the size of the group, the quality of the supervisor, the sex of the supervisor, and functional area. Although these variables are common to the models of individual performance and commitment, the analysis of group performance differs because: (1) the sample is filtered of those in one-deep work groups so as to measure group, as opposed to individual performance; and (2) the set of explanatory variables includes a more extensive set of group characteristics.[1] For example, a set of dummy variables test for the effects of the race and sex-family status composition of the group.[2]

The chapter concludes with a discussion of the gender-related issues within the larger context of the full range of problems affecting work groups.

8.1 GROUP MOBILITY

A group's ability to deploy quickly is of paramount importance in any consideration of group effectiveness. For the purpose of this study, measures of group readiness are extracted from the answers given to Question 46 of the Survey of Work Groups.

46. If your work group were deployed or mobilized, would the members of your work group be able to respond quickly?

A. Yes, all of them
B. Yes, most of them
C. Yes, a few of them
D. None of them

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[1] The inclusion of group demographic variables results in a smaller sample size because of missing data. Sensitivity tests indicate, however, that the smaller sample does not seem to bias the estimated coefficients.

[2] Dummy variables are used in place of continuous percentages because of the large proportion of groups having no members for specific sex-family status combinations.

It is important to remember that measures based on the responses to this question cannot constitute a formal assessment of mobility. Rather, they report the respondent's evaluation of his or her work group; hence, the quality and speed of a group's deployment are measured subjectively.

An estimated 37.6% of the Air Force believe that all of their work group could deploy quickly, while 47.9% believe that most and 14.5% believe that few or none of their work group could deploy quickly.

8.1.1 Descriptive Analysis

The descriptive analysis details the percentage of respondents who marked either "A" or "B" to the question, i.e., those who thought that most or all of their work group could respond quickly to a deployment. This split is arbitrary, but it seems to be the most appropriate proxy for the readiness of the Air Force as a whole. Table 8-1 shows how the percentage varies by functional area, by whether or not this area is traditional for women,[3] and by the percent female in the respondent's work group.

In both traditional and nontraditional functional areas, there appears to be a downward trend in group mobility by percent female. In traditional areas 85.6% of the enlisted personnel in all-male groups report that their group could deploy quickly,

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[3] In this section, traditional and nontraditional areas will always be referenced to women. Traditional areas are defined as those in which a disproportionately high number of women are located (i.e., the areas in which more than 22% of the population are estimated to be women: Comptroller; Intelligence; Medical; Manpower & Personnel; Supply, Services, and Contracting; and R&D, Administration, Command, and Other).

TABLE 8-1

GROUPS IN WHICH ALL MEMBERS COULD DEPLOY QUICKLY, BY FUNCTIONAL AREA AND PERCENT FEMALE
(Row Percentages*)

	Percent Female in Group (F)				
Functional Area	F = 0	0 < F < .15	.15 ≤ F < .30	F ≥ .30	Row Mean
TRADITIONAL AREAS	85.6	82.4	82.5	77.3	81.2
Comptroller					72.7
Intelligence					73.5
Medical					84.1
Manpower & Personnel					87.2
Research & Development**					70.2
Supply, Services, & Contracting					81.4
Admin., Command, & Other					83.6
NONTRADITIONAL AREAS	89.4	86.8	83.9	78.8	87.2
Civil Engineering					87.5
Depot Ops. & Maint.					83.2
Grd.Comm., Elec.Ops. & Maint.					76.7
Operations-Flight					90.8
Security Police					92.4
Training					79.9
Transportation					84.0
Weapons Sys. Maint.					89.1
COLUMN MEAN	88.9	86.0	83.3	77.8	85.5

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*Separate proportions for Functional Area-Percent Female combinations are not presented because of small cell sizes in the sample. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**Although Research & Development does not fit the definition of a traditional functional area, it is grouped here because the multivariate analysis combines it with the functional areas of Administration, Command, and Other.

while only 77.3% of the members of groups with at least 30% women believe so. In nontraditional areas 89.4% of those with no women in their work group, compared to 78.8% of respondents in groups with at least 30% women, agree that most of their group could respond quickly.

Overall, nontraditional areas are better able to deploy quickly than traditional areas.[4] The descriptive analysis is unable, however, to attribute this difference to any of the percent female categories. The multivarite analysis tests whether these results hold when variations in other factors are considered.

8.1.2 Multivariate Analysis

While descriptive analysis captures the distribution of the variable of interest, multivariate analysis attempts to uncover the best predictors of that variable. In this case, the distinction between respondents who believe all of their group could deploy quickly and those who do not reveals the most insight into the effects of the independent variables on group mobility.[5] The multivariate analysis, then, regresses a dichotomous variable (that takes on the value of 1 if the respondent marked "A" on Q46 and 0 if not) on the key characteristics and a set of group and individual characteristics that serve as controls. The regression results, tested with and without an index of supervisor quality, are depicted in Table 8-2.

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[4] The difference between the row means (87.2 - 81.2 = 6.0) is significant at the 1% level.

[5] Other definitions of the dependent variable were tested. Regression results using a 4-point mobility index yield estimated coefficients of the same signs and significance as in the reported model. However, the results prove inferior when a dichotomous dependent variable is used that distinguishes between groups in which all or most of the members could deploy quickly and those groups that could not.

Key Characteristics. The sex of the respondent does not contribute significantly to the dependent variable, either directly or indirectly, through its effect on percent female. The interaction term tests for whether the effect of percent female on mobility differs by sex of the respondent. The models indicate that no signficant difference exists. Thus, women do not judge the mobility of a group differently from men, regardless of the percent female in the work group.

However, the percent female in a group exerts a significant negative effect on group mobility. The estimated coefficient of -.1338 in Model 1 implies that increasing the female composition of a group from 10% to 60% will cause the group to be 6.69 percentage points less likely to deploy quickly.

Most of the effect of gender variables is driven by the nontraditional functional areas. Regressing the dependent variable on only the observations in nontraditional areas finds that the effect of increasing the concentration of females in the group is quite pronounced.[6] Table 8-3 lists the estimated gender effects. This model predicts that respondents in groups with 60% women are 15.26 percentage points less likely to believe that all of their work group could deploy quickly than are those in groups with 10% women. This may indicate that in nontraditional areas, where the work is usually more strenucus than in traditional areas, there may be a limit to the proportion of women in groups that is consistent with rapid deployment.

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[6] Regressing the dependent variable on respondents in traditional areas shows no gender effects.

TABLE 8-2

PROBABILITY OF ALL GROUP MEMBERS RESPONDING QUICKLY IF DEPLOYED

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
INTERCEPT TERM	.6034	15.79**	.2237	4.88**
KEY CHARACTERISTICS				
FEMALE RESPONDENT (Male)	-.0269	- .82	-.0191	- .59
PERCENT FEMALE IN GROUP	-.1338	-3.04*	-.1445	-3.33**
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	.0646	.79	.0768	.95
GROUP SIZE	-.0045	-4.96**	-.0047	-5.28**
SUPERVISOR QUALITY INDEX			.1009	14.56**
FEMALE SUPERVISOR (Male)	.0206	.94	.0240	1.11
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	.0581	1.90	.0649	2.16
Comptroller	-.0692	-1.73	-.0638	-1.61
Depot Ops. & Maint.	.0538	1.07	.0480	.97
Grd.Comm., Elec.Ops. & Maint.	-.0464	-1.51	-.0434	-1.44
Intelligence	-.0490	-1.17	-.0446	-1.08
Medical	.0637	1.79	.0626	1.79
Operations-Flight	.0864	2.57*	.0732	2.21
Manpower & Personnel	.0320	.86	.0186	.51
Security Police	.0981	2.83*	.0777	2.27
Training	.0308	.88	.0314	.92
Transportation	-.0412	-1.19	-.0493	-1.45
Weapons Sys. Maint.	.0055	.22	.0005	.02
R&D, Admin., Command, & Other	.0345	1.24	.0308	1.12

(continued)

TABLE 8-2

PROBABILITY OF ALL GROUP MEMBERS RESPONDING QUICKLY IF DEPLOYED

Variable Name	Model 1		Model 2	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
GROUP CHARACTERISTICS				
RACE COMPOSITION				
At least one black worker (None)	-.0448	-3.46**	-.0419	-3.28**
At least one Hispanic worker (None)	-.0257	-1.98	-.0243	-1.90
SEX-MARITAL-DEPENDENCY COMPOSITION				
At least 1 sgl. male, w/dep. (None)	.0019	.12	.0034	.22
At least 1 sgl. female, w/o dep. (None)	.0102	.70	.0139	.97
At least 1 sgl. female, w/dep. (None)	-.0597	-3.09*	-.0572	-3.00*
At least 1 w/military spouse, w/o dep. (None)	-.0252	-1.88	-.0237	-1.80
At least 1 w/military spouse, w/dep. (None)	-.0535	-4.05**	-.0490	-3.76**
At least 1 w/civilian spouse, w/o dep. (None)	-.0325	-2.83*	-.0285	-2.52*
At least 1 w/civilian spouse, w/dep. (None)	-.0524	-2.92*	-.0537	-3.04*
RANK COMPOSITION (All Enlisted Workers)				
At least one officer (None)	.0718	4.79**	.0656	4.44**
At least one civilian (None)	-.1160	-8.62**	-.1132	-8.54**
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	-.1309	-5.24**	-.1234	-5.01**
WORK SCHEDULE (Day Shift)				
Evening shift	-.0087	- .44	-.0039	- .20
Midnight shift	-.0411	-1.47	-.0310	-1.13
Extended or irregular hours	.0234	1.06	.0235	1.08
WORK PACE (Neither Fast Nor Slow)				
Very fast	.1011	5.82**	.0835	4.86**
Somewhat fast	.0384	2.75*	.0234	1.69
Somewhat or very slow	-.0623	-3.33**	-.0321	-1.73
WORK STRESS (Not Very Stressful)				
Very stressful	-.0101	- .52	.0141	.73
Somewhat stressful	-.0296	-2.08	-.0178	-1.27
Not at all stressful	.0572	2.90*	.0505	2.60*
TYPE OF GROUP				
Changing crew (No)	.0394	1.40	.0448	1.62
Supervisor of supervisors (No)	-.0218	- .93	-.0314	-1.36

(continued)

TABLE 8-2

PROBABILITY OF ALL GROUP MEMBERS RESPONDING QUICKLY IF DEPLOYED

	Model 1		Model 2	
Variable Name	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0207	1.09	.0228	1.22
PHYSICAL INDEX (Strength Required & Dirty Work)	.0093	1.62	.0067	1.18
ANY SHORTAGES LAST WEEK				
Personnel Shortages (None)	-.0933	-8.02**	-.0760	-6.59**
Equipment Shortages (None)	-.0373	-3.09*	-.0219	-1.84
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	.0261	1.65	.0243	1.56
Hispanic	-.0031	- .11	-.0028	- .10
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.0258	- .77	-.0235	- .71
Some college and beyond	-.0063	- .52	-.0034	- .29
MARITAL STATUS (Single)				
Married, military spouse	-.0141	- .62	-.0100	- .45
Married, civilian spouse	-.0077	- .51	-.0040	- .27
Separated/widowed/divorced	-.0303	-1.33	-.0225	-1.00
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0214	1.34	.0181	1.16
YOS 8 and beyond	.0534	3.39**	.0519	3.34**
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	.0051	.25	.0046	.23
Craftsmen and Services	.0294	1.10	.0338	1.29
Skilled Technicians	-.0663	-3.21*	-.0724	-3.55**
RESPONDENT IS A SUPERVISOR (No)	.0403	2.70*	.0383	2.60*
Sample Size		7,216		7,216
Mean of the Dependent Variable		.3762		.3762
F-Statistic		14.942		18.715
Adjusted R-Square		.1008		.1265

*Significant at the 5% level.
**Significant at the 1% level.

TABLE 8-3

GENDER EFFECTS ON GROUP MOBILITY IN NONTRADITIONAL AREAS (Model Without Supervisor Quality)

Variable Name	Estimated Coefficient	t - Ratio
FEMALE RESPONDENT	-.0544	-1.19
PERCENT FEMALE	-.3052	-4.24**
SEX BY PERCENT FEMALE	.1998	1.42

**Significant at the 1% level.

Using the entire sample, the size of a group is estimated to have a negative influence on group mobility. Given that the measure of mobility requires that all of the members of a group deploy quickly, this finding is not surprising.[7]

The sex of the supervisor does not affect the dependent variable. The functional area, however, does help to explain mobility, even after controlling for other group differences. Model 1 suggests that individuals in Operations and Security Police are about 9 percentage points more likely to believe that their group could deploy quickly than are members of groups in the area of Supply, Services, and Contracting. However, when supervisor quality is added to the model, these differences become insignificant.

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[7] The model with the dependent variable estimating the likelihood that most or all of a group could deploy quickly found no significant link with the size of the group.

A unit change in supervisor quality (1 to 5 scale) changes the estimated probability that a group can deploy all of its members quickly by 10.1 percentage points. This effect may dwarf all other measured factors. A shift of 1 point in supervisor quality would offset any difference by group size, while a change of 2 points would more than encompass any difference by percent female.

Group Characteristics. It is also hypothesized that the group's ability to deploy quickly is dependent on group demographics. Groups with a single woman with a dependent, a member of a military marriage with a dependent, or a military member married to a civilian with or without a dependent are less likely to be able to deploy quickly than are groups of all single males.[8] This result conforms to a priori expectations that dependent care often inhibits mobility.

The rank composition of a work group contributes significantly to the variation in the dependent variable. Groups with officers are more likely and groups with civilians less likely to deploy quickly than are groups of all enlisted members. Furthermore, groups with low levels of experience (high ratios of E1-3 to all enlisted) are relatively less likely to deploy all of its members.

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[8] The group demographic variables are based on Questions 14-23 of the Survey of Work Groups. Unlike the family status variables used in the chapters on individual performance and commitment, dependents are not delineated by age.

Several work place characteristics significantly influence group mobility. Increasing the pace or decreasing the stress of the work increases the likelihood of rapid deployment. Both personnel and equipment shortages hamper group mobility.

Individual Characteristics. In general, individual characteristics do not significantly alter the opinions of group mobility. Skilled Technicians, however, believe the mobility of their work group to be lower than do individuals in Administration and Support. In addition, respondents with at least 8 years of service believe their groups to be more able to deploy quickly than those who are YOS 4-7.

Unreported regressions show that the probability of all members of a group deploying quickly is not significantly related to (1) the interaction of supervisor's sex and the sex of the respondent; (2) the interaction between group size and the percent female in the group; (3) non-linear specifications of the percent female variables; and (4) the fraction of all enlisted Air Force personnel in the respondent's 2-digit AFSC expected to deploy.[9]

8.2 GROUP MORALE

Using the survey data, a measure of group morale is created from the answers to the following questions:

37. People in my work group work well together.

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[9] Based on data provided by the USAF that was not gathered from the survey. These fractions were calculated from the Air Force tables in the respondent's 2-digit AFSC code.

38. My group does a bad job of handling short deadlines and surprise schedule changes.

39. There is a friendly atmosphere in my work group.

40. My co-workers take pride in their work.

41. The workers in my work group are well qualified for the job.

42. My work group produces high quality work.

44. There is constant arguing among people in my work group.

Responses to the above questions, which range from "strongly agree" to "strongly disagree", were averaged to create four 5-point indices: (1) a combination of group quality questions (40, 41, and 42); (2) the average of questions indicative of group morale (37, 39, and 44); (3) the handling of deadlines (Question 38); and (4) the average of all seven rescaled responses.[10] The following correlation matrix shows that the indices are not easily separable:

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[10] The created indices are all scaled from 1, implying the lowest opinion of group morale, to 5, denoting the highest opinion of group morale. Thus a 1 is either the result of strongly disagreeing with a positive statement (37, 39, 40, 41, 42) or strongly agreeing with a negative statement (38, 44), while a 5 results from just the reverse.

TABLE 8-4

CORRELATION COEFFICIENTS OF GROUP PERFORMANCE INDICES

	INDEX 1	INDEX 2	INDEX 3	INDEX 4
INDEX 1: Quality	1.00			
INDEX 2: Interactions	.61	1.00		
INDEX 3: Deadlines	.39	.41	1.00	
INDEX 4: Overall	.87	.89	.61	1.00

All indices are highly correlated with all other indices, with the lowest correlations occurring between the measure of how well a group handles deadlines and the other three indices. The final index of overall functioning is almost coincidental with its three components. Therefore, this index is used as the dependent variable measuring group morale.

The implementation of an index is subject to some caveats. First, the scale is ordinal, even though the regression results are interpreted as though the index were cardinal. For each component of the index, marking Strongly Agree instead of Agree is assumed to be just as important quantitatively as marking Agree instead of Neutral or Neutral instead of Disagree. Second, the index is a self-reported rating of the group. Hence the estimated relationships between this subjective evaluation and other subjective impressions of the same individual (e.g., supervisor quality) may not reflect a causal path. Nevertheless, this index of group morale supports investigation of its principal correlates.

8.2.1 Descriptive Analysis

Table 8-5 lists the distribution of respondents' group morale ratings by functional area and percent female. Notice that the mean of the group morale index is quite high at 3.92 out of a possible 5.00. Although, on average, those in nontraditional areas rate the morale of their work groups as lower than those in traditional areas, this distinction is insignificant. In fact, none of the average morale ratings differ substantially from any other, either by functional area or by percent female. The standard deviation of the index, however, is .7126. This implies that there was wide variation in the sample as a whole, as 20% rate group morale as greater than 4.86 or less than 3.00. Hence, factors other than percent female or functional area seem to be predominant in determining group morale.

TABLE 8-5

MEAN GROUP MORALE AND QUALITY BY FUNCTIONAL AREA AND PERCENT FEMALE IN GROUP
(Row Means*)

Functional Area	F = 0	0 < F < .15	.15 ≤ F < .30	F ≥ .30	Row Mean
TRADITIONAL AREAS	4.04	3.87	3.93	3.93	3.94
Comptroller					3.92
Intelligence					4.04
Medical					4.05
Manpower & Personnel					4.06
Research & Development					4.11
Supply, Services & Contracting					3.82
Admin.,Command & Other					4.00
NONTRADITIONAL AREAS	3.95	3.81	3.91	3.95	3.91
Civil Engineering					3.83
Depot Ops. & Maint.					3.90
Grd.Comm.,Elec.Ops.& Maint.					3.94
Operations-Flight					4.10
Security Police					3.79
Training					4.01
Transportation					3.90
Weapons Sys. Maint.					3.91
COLUMN MEAN	3.96	3.82	3.92	3.93	3.92

*Group Morale is a constructed index that ranges from 1 to 5. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

8.2.2 Multivariate Analysis

The multivariate regression analysis tests whether these results hold when other factors are considered, and whether other key variables influence group morale. Table 8-6 presents the results from the multivariate analysis, estimating the model parameters with and without the supervisor quality index as an explanatory variable.

Note that including the supervisor quality index as an explanatory variable for group quality and morale, when both are reported by the same individual, may introduce endogeneity into the model and bias the estimates of other parameters. Neither of these indices is measured objectively or by another member of the same work group. The estimated coefficient of .3860 (t-ratio of 43.36) should therefore be interpreted as a measure of association and _not_ causation.

Key Characteristics. In both models, female respondents report significantly lower ratings of group morale than men (14.39 and 11.22 percentage points lower). The coefficient on percent female is significant only in the model with supervisor quality, although it is almost significant in Model 1. However, the estimated relationship between group morale and the percent female in the group differs significantly by gender as indicated by the large and significant coefficient on the "female respondent-percent female interaction" (b_2). This coefficient and the coefficient on percent female (b_1) can be combined to obtain separate morale-percent female relationships for men and women, as shown in Table 8-7.

TABLE 8-6

GROUP MORALE AND QUALITY INDEX
(Scale of 1 to 5)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
INTERCEPT TERM	4.2772	78.53**	2.8305	48.18**
KEY CHARACTERISTICS				
FEMALE RESPONDENT (Male)	-.1439	-3.08*	-.1122	-2.70*
PERCENT FEMALE IN GROUP	-.1342	-2.13	-.1728	-3.09*
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	.2902	2.48*	.3280	3.16*
GROUP SIZE	-.0048	-3.69**	-.0055	-4.83**
SUPERVISOR QUALITY INDEX			.3860	43.36**
FEMALE SUPERVISOR (Male)	.0523	1.68	.0642	2.32
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	.0416	.96	.0702	1.81
Comptroller	-.0298	-.52	-.0135	-.27
Depot Ops. & Maint.	.0915	1.26	.0663	1.03
Grd.Comm., Elec.Ops. & Maint.	.0189	.43	.0208	.53
Intelligence	.1244	2.09	.1440	2.72*
Medical	.1489	2.94*	.1441	3.20*
Operations-Flight	.2028	4.25**	.1472	3.47**
Manpower & Personnel	.1651	3.11*	.1130	2.40
Security Police	.1737	3.51**	.0881	2.00
Training	.0296	.60	.0298	.68
Transportation	.0562	1.15	.0234	.54
Weapons Sys. Maint.	.0478	1.30	.0280	.86
R&D, Admin., Command, & Other	.0842	2.13	.0660	1.88

(continued)

TABLE 8-6

GROUP MORALE AND QUALITY INDEX
(Scale of 1 to 5)

Variable Name	Model 1		Model 2	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
GROUP CHARACTERISTICS				
RACE COMPOSITION				
At least one black worker (None)	-.0871	-4.73**	-.0745	-4.55**
At least one Hispanic worker (None)	-.0227	-1.23	-.0193	-1.18
SEX-MARITAL-DEPENDENCY COMPOSITION				
At least 1 sgl. male, w/dep. (None)	-.0428	-1.92	-.0375	-1.89
At least 1 sgl. female, w/o dep. (None)	-.0175	-.84	-.0041	-.22
At least 1 sgl. female, w/dep. (None)	-.0539	-1.95	-.0429	-1.75
At least 1 w/military spouse, w/o dep. (None)	-.0295	-1.54	-.0246	-1.45
At least 1 w/military spouse, w/dep. (None)	-.0557	-2.95*	-.0382	-2.28
At least 1 w/civilian spouse, w/o dep. (None)	-.0341	-2.09	-.0186	-1.28
At least 1 w/civilian spouse, w/dep. (None)	-.0430	-1.68	-.0483	-2.12
RANK COMPOSITION				
At least one officer (None)	.0551	2.57*	.0309	1.63
At least one civilian (None)	-.0194	-1.01	-.0107	-.63
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	-.1389	-3.90**	-.1091	-3.45**
WORK SCHEDULE (Day Shift)				
Evening shift	.0720	2.55*	.0868	3.46**
Midnight shift	.0780	1.95	.1174	3.30**
Extended or irregular hours	.0009	.03	.0001	.01
WORK PACE (Neither Fast Nor Slow)				
Very fast	.2546	10.28**	.1908	8.66**
Somewhat fast	.1778	8.90**	.1232	6.93**
Somewhat or very slow	-.3110	-11.69**	.1922	-8.08**
WORK STRESS (Not Very Stressful)				
Very stressful	-.2930	-10.53**	-.2049	-8.26**
Somewhat stressful	-.1239	-6.35**	-.0852	-4.72**
Not at all stressful	.0992	3.54**	.0718	2.88**
TYPE OF GROUP				
Changing crew (No)	-.1227	-3.04*	-.0991	-2.77*
Supervisor of supervisors (No)	.0400	1.21	.0053	.18

(continued)

TABLE 8-6

GROUP MORALE AND QUALITY INDEX
(Scale of 1 to 5)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0105	.39	.0202	.84
PHYSICAL INDEX (Strength Required & Dirty Work)	-.0076	-.94	-.0183	-2.53*
ANY SHORTAGES LAST WEEK				
Personnel Shortages (None)	-.2178	-13.12**	-.1534	-10.35**
Equipment Shortages (None)	-.1278	-7.45**	-.0677	-4.42**
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.0322	-1.42	-.0401	-1.99
Hispanic	-.0721	-1.86	-.0761	-2.21
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.0640	-1.35	-.0539	-1.28
Some college and beyond	-.0206	-1.21	-.0098	-.64
MARITAL STATUS (Single)				
Married, military spouse	-.0072	-.22	.0082	.28
Married, civilian spouse	.0318	1.48	.0450	2.37
Separated/widowed/divorced	.0066	.20	.0334	1.15
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	-.0101	-.44	-.0260	-1.29
YOS 8 and beyond	.1058	4.71**	.0978	4.90**
APSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	.0221	.75	.0189	.72
Craftsmen and Services	-.0176	-.46	.0008	.03
Skilled Technicians	.0156	.53	-.0070	-.27
RESPONDENT IS A SUPERVISOR (No)	.1193	5.60**	.1106	5.85**
Sample Size		7,052		7,052
Mean of the Dependent Variable		3.9746		3.9746
F-Statistic		24.350		62.228
Adjusted R-Square		.1611		.3387

*Significant at 5% level.
**Significant at 1% level.

TABLE 8-7

EFFECT OF PERCENT FEMALE ON GROUP MORALE INDEX

		Model 1		Model 2	
Sex		Estimated Coefficient	t-Ratio	Estimated Coefficient	t-Ratio
MALES	$b_1=$	-.1342	-2.13	-.1728	-3.09*
FEMALES	$b_1+b_2=$	.1561	1.42	.1552	1.59

*Significant at the 5% level.
Note: t-ratio for $b_1+b_2=$ $(b_1+b_2)/(var(b_1)+var(b_2)+2cov(b_1,b_2))1/2$

The estimated effects in Table 8-7 shows that although the morale-percent female relationship differs by sex of the respondent, neither of the estimated coefficients is significantly different from 0.

The coefficients on group size are significant and negative: enlisted personnel feel that morale is lower in bigger groups. Model 1, without supervisor quality, finds that if the average group's size increased by 10, then the morale index would fall by 4.8% of one point. Thus, the effect of group size is significant but very small.

Including "group size-percent female interaction" in the regression analysis shows that in the traditional functional areas, the size of the group interacted with the percent female in the group has a significant effect. This relationship does not hold in nontraditional areas. Table 8-8 lists the key variables from this model specification.

TABLE 8-8

GENDER AND SIZE EFFECTS ON GROUP MORALE INDEX IN TRADITIONAL AREAS
(Alternate Specification, Without Supervisor Quality)

Variable Name	Estimated Coefficient	t-ratio
FEMALE RESPONDENT (Male)	-.0522	-1.33
PERCENT FEMALE	.1134	1.00
GROUP SIZE-PERCENT FEMALE INTERACTION	-.0246	-2.46*
GROUP SIZE	-.0028	- .78

*Significant at the 5% level.

The significant and negative coefficient on the interaction term indicates that (1) for a given size, increasing the percent female lowers group morale, and (2) for a given percent female, increasing the group size lowers the morale index. Neither percent female nor group size, however, is significant by itself in the interaction model. Thus, the partial derivative of a change in the percent female on the 5-point morale index is equal to:

$$-.0246 \times (\text{group size}),$$

while the partial derivative for a change in the size of the group is equal to:

$$-.0246 \times (\text{percent female}).$$

Therefore, the predicted changes in the morale index because of a 10 percentage point increase in the percent female for groups of 10 and 20 are:

- o −.0246 (−.0246 times the group size of 10 times the increase of .10 in the percent female); and
- o −.0492 (−.0246 times the group size of 20 times the increase of .10 in the percent female).

Similarly, the effect of doubling and tripling, respectively, the size of a group, given that it initially has 10 members and the concentration of women remains constant at .10, is:

- o −.0246 (−.0246 times the percent female of .10 times the increase of 10 in the size of the group); and
- o −.0492 (−.0246 times the percent female of .10 times the increase of 20 in the size of the group).

Although these effects are significant, only major changes in the gender composition and size of the group substantially alter group morale. Thus, this interactive model is in agreement with the previous specification: group morale is relatively insensitive to moderate changes in the group size and percent female.

Referring to the original models, even after controlling for other sources of variation, significant differences do exist across functional areas. Four areas in Model 1 (Medical, Operations, Manpower & Personnel, and Security Police) and three areas in Model 2 (Intelligence, Medical, and Operations) report significantly higher ratings than the omitted reference area of Supply, Services, and Contracting.

Group Characteristics. Groups with high-ranking members appear to have high morale, as groups with an officer and groups with relatively high group experience (low ratios of E1-3 to all enlisted) are associated with high group morale.

Model 1 estimates that groups with a member of a military marriage with dependents have a morale rating of 5.6 percentage points lower than groups without such a member. Although this effect is statistically significant, it is not of great magnitude.

As before, pace is positively related to the index, while stress is negatively related to the index, and personnel and equipment shortages are associated with low levels of group morale. Members of changing crews report lower morale than those on stable work crews, but workers on evening shifts rate group morale higher than those on day shifts.

Individual Characteristics. Once again, group performance is relatively unaffected by individual characteristics.[11] However, those with 8 or more years of service perceive higher group morale than those between YOS 4 and 7, and supervisors report higher group morale and quality than non-supervisors.

8.3 WORK AROUND PROBLEM

Another important indicator of the functioning of a group is the incidence of work around, where some members of the group are not contributing a proper share to total group output. As stated in the questionnaire,

> Some people in work groups don't always "carry their own weight," or work as hard as they should. There are many reasons for this. For example, they don't have the ability, they don't work hard enough, they have health problems, and so on.

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[11] In addition, the interaction of the sex of the respondent and sex of the supervisor proved to be insignificant, and the effect of percent female on morale was not estimated to be non-linear.

The questionnaire went on to ask two questions:

79. In the work group you defined in the box on your answer sheet at Q.6, how many **men** do not "carry their own weight".[12]

82. In your work group, how many **women** do not "carry their own weight".

Responses to these questions are used to construct the work around analysis variables.

8.3.1 Descriptive Analysis: Probability of Work Around

Table 8-9 lists two different measures of work around derived for males, females, and all group members: the first is calculated as the probability of occurrence (whether work around exists), and the second as the percentage of group members being worked around.

The former shows that 28.1% of all groups with females have a female work around problem, whereas 48.9% of the groups with males have a male work around problem. This is a misleading statistic because there are more males than females in most work groups, thereby creating a greater likelihood of a male work around problem, even if each sex has the same propensity not to carry its proper weight. The table also shows that a higher percentage of females are worked around (relative to males).

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[12] Bold letters and underline are as they appear in the questionnaire.

TABLE 8-9

MALE, FEMALE, AND TOTAL WORK AROUND, BY FUNCTIONAL AREA
(Percentages*)

Functional Area	Male Work Around	Female Work Around	Total Work Around
Civil Engineering			
Percent of Groups**	52.4	21.4	53.5
Percent of Group Members***	12.6	16.4	17.8
Comptroller			
Percent of Groups	40.4	33.3	52.4
Percent of Group Members	12.5	15.1	13.4
Depot Ops. & Maint.			
Percent of Groups	48.3	32.4	51.0
Percent of Group Members	10.8	22.0	11.7
Grd.Comm., Elec.Ops. & Maint.			
Percent of Groups	43.1	26.9	46.2
Percent of Group Members	12.8	17.8	14.2
Intelligence			
Percent of Groups	40.2	23.0	45.4
Percent of Group Members	11.4	12.0	11.2
Medical			
Percent of Groups	46.3	32.0	52.3
Percent of Group Members	13.8	12.1	13.3
Operations-Flight			
Percent of Groups	36.0	26.6	41.2
Percent of Group Members	10.0	18.7	11.3
Manpower & Personnel			
Percent of Groups	36.6	24.5	42.5
Percent of Group Members	12.3	14.1	13.2
Research & Development			
Percent of Groups	28.5	35.4	37.8
Percent of Group Members	6.5	22.3	12.7

(continued)

TABLE 8-9

MALE, FEMALE, AND TOTAL WORK AROUND, BY FUNCTIONAL AREA
(Percentages*)

Functional Area	Male Work Around	Female Work Around	Total Work Around
Security Police			
Percent of Groups	44.3	29.0	46.0
Percent of Group Members	11.6	18.8	12.9
Supply, Services, & Contracting			
Percent of Groups	44.3	26.2	49.4
Percent of Group Members	12.7	12.8	13.2
Training			
Percent of Groups	40.2	23.5	45.2
Percent of Group Members	10.0	14.4	10.8
Transportation			
Percent of Groups	46.0	28.3	49.5
Percent of Group Members	11.5	18.5	11.7
Weapons Sys. Maint			
Percent of Groups	51.5	31.5	54.6
Percent of Group Members	13.5	23.8	16.4
Admin., Command & Other			
Percent of Groups	36.9	23.3	43.6
Percent of Group Members	10.6	11.9	11.1
Column Total			
Percent of Groups	45.9	28.1	49.8
Percent of Group Members	12.7	17.4	14.2

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*Percentages are rounded to the nearest tenth. Statistics are based on the incidence of work around by survey respondents; data have been weighted to correct for the oversampling of females. Statistics on male and female work around are calculated only for groups with males and females, respectively.

**"Percent of Groups" is the fraction of all work groups in which respondents report work around problems for male members, female members, and all members.

***"Percent of Group Members" is the mean percent of males, females, and all group members who are worked around.

Note: Several functional areas have fewer than 100 sample observations. The sample contains 28 females in Depot Ops. & Maint.; 16 females and 59 males in Research & Development; 66 females in Security Police; and 95 females in Transportation.

Table 8-10 lists the percentage of respondents who note either a male or a female work around problem, broken down by percent female and type of group.[13]

The probability of the occurrence of a work around problem appears to be U-shaped. In both traditional and nontraditional areas, all-male groups are associated with the lowest probability of a problem, groups with low proportions of women have the greatest probability of a problem, and groups with a larger percentage of females have less of a problem. There appears to be no pattern to the percent of people worked around within each group. Finally, groups in nontraditional areas with less than 15% women are more likely to have a work around problem than other groups in untraditional areas, but the two areas are indistinguishable for groups with a higher concentration of women.

8.3.2 Multivariate Analysis: Probability of Work Around

The dependent variable is a binary variable that takes on the value of 1 if a male or female work around problem occurs and 0 if not. It is constructed in this manner (as opposed to estimating separate male and female work around models), so as to take advantage of the entire sample and to determine any links between male and female work around problems. The results from the regression analysis appear in Table 8-11.

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[13] The statistics from Tables 8-9 and 8-10 are not completely comparable (e.g., Table 8-9 reports that an estimated 49.8% of all groups have a work around problem, while 8-10 reports 49.9%) because Table 8-10 does not include respondents with missing data on the percent female in the group.

TABLE 8-10

GROUP WORK AROUND PROBLEM BY FUNCTIONAL AREA AND PERCENT FEMALE IN GROUP
(Percentages*)

Functional Area	F = 0	Percent Female in Group (F) 0 < F < .15	.15 ≤ F < .30	F ≥ .30	Row Average
TRADITIONAL AREAS					
Percent of groups**	35.2	53.3	50.2	51.0	47.7
Percent of group members***	11.2	13.0	12.1	13.5	12.6
NONTRADITIONAL AREAS					
Percent of groups	44.7	63.7	55.2	45.2	50.7
Percent of group members	14.6	14.3	15.5	16.8	14.8
COLUMN AVERAGE					
Percent of groups	43.4	61.8	53.1	49.1	49.9
Percent of group members	14.1	14.0	14.0	14.6	14.2

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*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**"Percent of groups" is the fraction of all work groups in which respondents report work around problems for any members.

***"Percent of groups members" is the mean percent of all groups members who are worked around.

TABLE 8-11

PROBABILITY OF A WORK AROUND PROBLEM

	Model 1		Model 2	
Variable Name	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INTERCEPT TERM	.0038	.10	.4922	10.77
KEY CHARACTERISTICS				
SEX OF RESPONDENT (Males in an All-Male Group)				
Female	.1321	3.86**	.1213	3.63**
Male in a mixed group	.0805	4.37**	.0803	4.47**
PERCENT FEMALE IN GROUP	-.0781	-1.56	-.0648	-1.33
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	-.0354	- .41	-.0484	- .57
GROUP SIZE	.0072	7.92**	.0075	8.40**
SUPERVISOR QUALITY INDEX			-.1303	-18.84**
FEMALE SUPERVISOR (Male)	-.0399	-1.81	-.0439	-2.04
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	.0276	.90	.0180	.60
Comptroller	.0754	1.86	.0698	1.77
Depot Ops. & Maint.	.0161	.31	.0246	.49
Grd. Comm., Elec. Ops. & Maint.	.0420	1.35	.0414	1.37
Intelligence	-.0445	-1.06	-.0512	-1.24
Medical	.0176	.49	.0192	.55
Operations-Flight	.0129	.38	.0317	.96
Manpower & Personnel	-.0252	- .67	-.0076	- .21
Security Police	-.0605	-1.73	-.0316	- .92
Training	.0366	1.04	.0365	1.07
Transportation	-.0304	- .88	-.0194	- .57
Weapons Sys. Maint.	.0417	1.61	.0483	1.91
R&D, Admin., Command, & Other	.0023	.08	.0084	.31

(continued)

TABLE 8-11

PROBABILITY OF A WORK AROUND PROBLEM

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
GROUP CHARACTERISTICS				
RACE COMPOSITION				
At least one black worker (None)	.0746	5.72**	.0703	5.53**
At least one Hispanic worker (None)	.0374	2.86*	.0363	2.84*
SEX/MARITAL-DEPENDENCY COMPOSITION				
At least 1 sgl. male, w/dep. (None)	.0268	1.70	.0250	1.63
At least 1 sgl. female, w/o dep. (None)	.0254	1.60	.0210	1.35
At least 1 sgl. female, w/dep. (None)	.0189	.95	.0152	.79
At least 1 w/military spouse, w/o dep. (None)	-.0037	- .27	-.0054	- .40
At least 1 w/military spouse, w/dep. (None)	.0596	4.43**	.0538	4.09**
At least 1 w/civilian spouse, w/o dep. (None)	.0348	3.00*	.0295	2.61*
At least 1 w/civilian spouse, w/dep. (None)	.0916	5.05**	.0934	5.28**
RANK COMPOSITION				
At least one officer (None)	-.0303	-2.00	-.0221	-1.50
At least one civilian (None)	.0262	1.93	.0233	1.76
REL.EXPERIENCE (Ratio of E1-3 to All Enlisted)	.1254	4.98**	.1153	4.69**
WORK SCHEDULE (Day Shift)				
Evening shift	-.0537	-2.68*	-.0587	-3.01*
Midnight shift	-.0216	- .77	-.0350	-1.27
Extended or irregular hours	-.0298	-1.33	-.0295	-1.35
WORK PACE (Neither Fast Nor Slow)				
Very fast	-.0093	- .53	.0123	.72
Somewhat fast	.0154	1.09	.0338	2.45*
Somewhat or very slow	.1426	7.58**	.1024	5.54**
WORK STRESS (Not Very Stressful)				
Very stressful	.1075	5.46**	.0778	4.04**
Somewhat stressful	.0424	2.96*	.0277	1.97
Not at all stressful	-.0464	-2.34	-.0371	-1.92
TYPE OF GROUP				
Changing crew (No)	-.0490	-1.72	-.0570	-2.05
Supervisor of supervisors (No)	-.0293	-1.25	-.0176	- .77

(continued)

TABLE 8-11

PROBABILITY OF A WORK AROUND PROBLEM

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0579	3.02*	.0547	2.92*
PHYSICAL INDEX (Strength Required & Dirty Work)	-.0008	- .14	.0028	.50
ANY SHORTAGES LAST WEEK				
Personnel shortages (None)	.1448	12.33**	.1231	10.69**
Equipment shortages (None)	.1263	10.41**	.1060	8.92**
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.0611	-3.81**	-.0585	-3.73**
Hispanic	-.0102	- .37	-.0088	- .33
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	.0201	.60	.0167	.51
Some college and beyond	.0250	2.06	.0212	1.80
MARITAL STATUS (Single)				
Married, military spouse	.0090	.39	.0038	.17
Married, civilian spouse	.0026	.17	-.0018	- .12
Separated/widowed/divorced	-.0116	- .51	-.0207	- .92
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	-.0080	- .50	-.0026	- .17
YOS 8 and beyond	-.0448	-2.82*	-.0421	-2.72*
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	-.0242	-1.15	-.0231	-1.13
Craftsmen and Services	-.0509	-1.89	-.0571	-2.18
Skilled Technicians	-.0118	- .57	-.0042	- .21
RESPONDENT IS A SUPERVISOR (No)	-.0169	-1.12	-.0139	- .95
Sample Size		7,052		7,052
Mean of the Dependent Variable		.4983		.4983
F-Statistic		24.114		30.828
Adjusted R-Square		.1620		.2024

*Significant at the 5% level.
**Significant at the 1% level.

Key Characteristics. For these regressions, males in mixed groups are distinguished from males in all-male groups,[14] creating a new "sex of respondent" dummy variable.[15] This delineation is important to the interpretation of the model. In the models of group mobility and morale, testing for the effect of the sex of the respondent is, in effect, testing whether males and females use the same scale when measuring the dependent variable. Men and women are not answering different questions, but they might answer them in different ways. The new "sex of the respondent" dummy variable permits tests of whether men in mixed groups are more likely to experience a work around problem than are men in all-male groups.[16] Using this interpretation, mixed groups are at least 8 percentage points more likely to experience a work around problem than all-male groups.

The probability of work around is estimated to increase with group size. Increasing the number of people in an average group by 10 would increase the likelihood of work around by 7.2 percentage points when supervisor quality is not included in the model. This finding is explicable by two distinct hypotheses. First, the likelihood that an individual is worked around might be independent of group size, which would imply that the probability that a group is experiencing a problem is the sum of probabilities that its members do not carry their own weight. Thus, by definition, increasing group size raises the probability that at least one person will be worked around. Second, the size of the group might have negative effects on the cohesiveness of the group. If this were true, then larger groups would be more likely to experience a problem than smaller groups because of the relative lack of group unity.

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[14] This distinction was tested in the models of group mobility and group morale and quality, and found to be insignificant.

[15] The female category is not broken down further, because only 40 female respondents had no men in their work group.

[16] It is still possible to posit that the coefficients represent different measurement scales. This interpretation is implausible because males in mixed groups were found to respond no differently than men in all-male groups to other measures of performance, and there is no significant difference between women and men in mixed groups in their reports of the occurrence of work around (t = .97).

Although the proportion of women in a group appears to have an insignificant effect on overall work around, the interaction of the group's size and the percent female in the group has a significant effect on the probability of work around. Table 8-12 lists the findings on some of the key variables of a regression in which this interaction is included in the model in place of the female respondent-percent female interaction.

TABLE 8-12

PROBABILITY OF A WORK AROUND PROBLEM
(Alternate Specification, Without Supervisor Quality)

Variable Name	Estimated Coefficient	t - Ratio
SEX OF RESPONDENT (Male in an All-Male Group)		
Female	.1283	4.99**
Male in a Mixed Group	.0865	4.89**
PERCENT FEMALE IN THE GROUP	-.1831	-3.26**
GROUP SIZE-PERCENT FEMALE INTERACTION	.0141	2.96*
GROUP SIZE	.0061	6.17**

*Significant at the 5% level.
**Significant at the 1% level.

Table 8-12 shows that differentiation of the estimated equation with respect to group size implies that the change in the likelihood of work around brought about by a marginal change in the size of the work group is .0061 + .0141 x (percent female). Thus, regardless of the percent female in the group, changing the size of the group positively alters the probability of work around. In addition, the effect of a change in group size on work around is accentuated by higher concentrations of women. The effect for the average group (i.e., containing the mean percent women of 13.2) is to raise the work around probability by .0079 for every added member of the group. Hence, adding 10 members to the average group would increase the likelihood of work around by about 8 percentage points.

In a similar manner, the derived effect of a change in the percent female on the probability of work around is -.1813 + .0141 x (size of the group). Hence, in groups of fewer than 13 people, increasing the percent female is predicted to lower the likelihood of a work around problem. Except in unusual gender composition and group size configurations, this beneficial effect does not offset the increase in the probability of work around that results from the presence of females in the work group.

For groups with more than 13 people, raising the percentage of women is predicted to increase the likelihood of a work around problem, and this problem becomes more acute as the group size grows. Groups with double the average group size and percent female (group size of 2 x (11.7) = 23.4, percent of female of 2 x (.132) = .264) are 11.3 percentage points more likely to have a work around problem than the average group ((-.1813 x .132) + (.0061 x 11.7) + (.0141 x 11.7 x .132 x 3)). It is clear, then, that large groups with a high percentage of females are the most likely to experience a work around problem. Although the percent female in the work group affects the probability of work around, the relationship is not strong. In groups with 10 to 16 members, changing the proportion of females by 50 percentage points would change the work around probability by, at most, 2.1 percentage points. Hence, overall, the likelihood of work around is relatively insensitive to the percent female in the work group.

Referring to the original specification listed in Table 8-11, the supervisor quality index is estimated to have a large and negative effect on the probability of work around. Changing the 5-point supervisor quality index by one point causes a 13.03 percentage point change in the dependent variable.[17]

Although the sex of the supervisor has no influence on the dependent variable, this is only true for traditional areas. Regressing the dependent variable only on observations in nontraditional areas shows that the 233 respondents in these areas with a female supervisor report a significantly lower probability of work around than those supervised by males, when controlling for the quality of the supervisor. Group members with a female supervisor report a work around problem 8.67 percentage points less often than respondents with a male supervisor.[18]

None of the functional areas is significantly different from any other after controlling for other group factors. The work around phenomenon exhibits a stronger relationship to other group characteristics than to its functional area. Thus, functional area does not help to explain the variation in the dependent variable.

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[17] This again raises the question of endogeneity. Individuals who like their supervisor could simply be less likely to report any problems with their group.

[18] Unreported regressions show that the sex of the supervisor has an additive effect, i.e., its effect is independent of the sex of the respondent. Furthermore, the effect of percent female is linear.

Group Characteristics. Group demographics are significant predictors of the probability of a work around problem. Significantly more persons in groups with a military member who is married to someone also serving in the military and has a dependent or groups containing a military person with a civilian spouse, both with and without dependents, report a work around problem than those in groups without these marital-dependency status combinations. These demographic factors raise the likelihood of a problem by 3.0 to 9.3 percentage points.

Groups with relatively little experience (i.e., high ratios of E1-3 to all enlisted personnel) are associated with higher probabilities of work around, and the presence of officers has no effect on work around.

Groups with evening shifts are less likely to have work around problems than are groups with daytime shifts. Stress on the job, a slow work pace, and a hard work environment are associated with high probabilities of work around. Finally, groups that experience either personnel or equipment shortages are more likely to have a work around problem than groups without shortages.

Individual Characteristics. Respondents with eight or more years of service are less likely to report work around than are those between YOS 4 and 7.

8.3.3 Multivariate Analysis: Conditional Work Around Problem

Multivariate analysis is also conducted on the dependent variable measuring the percent of group members worked around (Q79 + Q82)/Q12. This variable is regressed on only those observations that note a work around problem.[19] The results from this conditional regression are listed in Table 8-13.

By construction, the dependent variable is skewed: in general, groups cannot work around most of their members, and the regression includes only those groups that work around some members. Given this constraint, the distribution is fairly well-behaved, with a median of 20.0% and an estimated 50% of the groups in the Air Force working around between 14.3% and 33.3% of their members.

Key Characteristics. Quite striking is that males in mixed groups with a work around problem report they work around 3.63% fewer members than do females or males in all-male groups. Although males in mixed groups are more likely to report a work around problem than are all-male groups, those with a problem note that it is less widespread than respondents in all-male groups with a problem.

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[19] Results from the unconditional regression of the percentage of group members worked around show no significant coefficient: the linear model is unable to account for both the large proportion of groups without a problem and the variations within each group with a problem.

TABLE 8-13

PERCENT OF GROUP WORKED AROUND
(For Groups With A Reported Work Around Problem)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
INTERCEPT TERM	.3292	17.07**	.4705	22.01**
KEY CHARACTERISTICS				
SEX OF RESPONDENT (Male in an All-Male Group)				
Female	.0125	.83	.0119	.81
Male in mixed group	-.0363	-4.22**	-.0339	-4.05**
PERCENT FEMALE IN GROUP	.1693	5.67**	.1722	5.92**
FEMALE RESPONDENT-PERCENT FEMALE INTERACTION	-.1463	-3.43**	-.1508	-3.63**
GROUP SIZE	-.0031	-7.93**	-.0029	-7.65**
SUPERVISOR QUALITY INDEX			-.0429	-13.82**
FEMALE SUPERVISOR (Male)	-.0020	- .19	-.0052	- .50
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	-.0024	- .17	-.0050	- .36
Comptroller	-.0249	-1.36	-.0244	-1.37
Depot Ops. & Maint.	-.0232	- .98	-.0173	- .75
Grd. Comm., Elec. Ops.	.0071	.49	.0121	.85
Intelligence	-.0273	-1.33	-.0285	-1.42
Medical	-.0141	- .84	-.0108	- .66
Operations-Flight	-.0102	- .63	-.0049	- .31
Manpower & Personnel	.0087	.47	.0150	.82
Security Police	.0114	.65	.0226	1.31
Training	-.0267	-1.58	-.0274	-1.66
Transportation	-.0076	- .47	-.0060	- .38
Weapons Sys. Maint.	-.0067	- .55	-.0034	- .29
R&D, Admin., Command, & Other	-.0252	-1.87	-.0231	-1.76

(continued)

TABLE 8-13

PERCENT OF GROUP WORKED AROUND
(For Groups With A Reported Work Around Problem)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
GROUP CHARACTERISTICS				
RACE COMPOSITION				
At least one black worker (None)	-.0113	-1.79	-.0108	-1.76
At least one Hispanic worker (None)	-.0054	- .93	-.0042	- .74
SEX-MARITAL-DEPENDENCY COMPOSITION				
At least 1 sgl. male, w/dep. (None)	.0077	1.10	.0079	1.17
At least 1 sgl. female, w/o dep. (None)	-.0222	-3.09*	-.0233	-3.33**
At least 1 sgl. female, w/dep. (None)	-.0124	-1.43	-.0122	-1.43
At least 1 w/military spouse, w/o dep. (None)	-.0060	- .97	-.0078	-1.30
At least 1 w/military spouse, w/dep. (None)	.0003	.06	-.0013	- .22
At least 1 w/civilian spouse, w/o dep. (None)	-.0213	-3.89**	-.0219	-4.11**
At least 1 w/civilian spouse, w/dep. (None)	-.0230	-2.46*	-.0211	-2.32
RANK COMPOSITION				
At least one officer (None)	-.0204	-2.86*	-.0179	-2.57*
At least one civilian (None)	-.0381	-6.17**	-.0368	-6.13**
RELATIVE EXPERIENCE (Ratio of E1-3 To All Enlisted)	.0261	2.07	.0268	2.18
WORK SCHEDULE (Day Shift)				
Evening shift	-.0056	- .59	-.0076	- .83
Midnight shift	-.0019	- .14	-.0022	- .17
Extended or irregular hours	.0149	1.43	.0157	1.55
WORK PACE (Neither Fast Nor Slow)				
Very fast	-.0207	-2.48*	-.0145	-1.78
Somewhat fast	-.0279	-4.13**	-.0210	-3.18*
Somewhat or very slow	.0412	4.80**	.0269	3.20*
WORK STRESS (Not Very Stressful)				
Very stressful	.0527	5.82**	.0399	4.50**
Somewhat stressful	.0212	3.10*	.0160	2.40
Not at all stressful	-.0045	- .45	-.0026	- .26
TYPE OF GROUP				
Changing crew (No)	.0304	2.19	.0244	1.81
Supervisor of supervisors (No)	.0060	.53	.0106	.96

(continued)

TABLE 8-13

PERCENT OF GROUP WORKED AROUND
(For Groups With A Reported Work Around Problem)

Variable Name	Model 1 Estimated Coefficient	Model 1 t - Ratio	Model 2 Estimated Coefficient	Model 2 t - Ratio
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.0109	1.24	.0121	1.41
PHYSICAL INDEX (Strength Required & Dirty Work)	-.0051	-1.88	-.0038	-1.42
ANY SHORTAGES LAST WEEK				
Personnel shortages (None)	.0279	5.15**	.0236	4.46**
Equipment shortages (None)	.0178	3.16*	.0130	2.38
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	.0008	.11	-.0014	- .19
Hispanic	.0206	1.65	.0228	1.88
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	.0142	.88	.0135	.86
Some college and beyond	.0142	2.50*	.0134	2.43
MARITAL STATUS (Single)				
Married, military spouse	.0003	.03	-.0034	- .33
Married, civilian spouse	-.0105	-1.51	-.0126	-1.87
Separated/widowed/divorced	.0027	.25	-.0013	- .12
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0062	.86	.0073	1.04
YOS 8 and beyond	-.0014	- .18	-.0019	- .26
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	.0128	1.31	.0139	1.46
Craftsmen and Services	-.0210	-1.64	-.0234	-1.87
Skilled Technicians	-.0026	- .26	.0009	.09
RESPONDENT IS A SUPERVISOR (No)	-.0076	-1.08	-.0026	- .37
Sample Size		3,540		3,540
Mean of the Dependent Variable		.2584		.2584
F-Statistic		10.510		14.080
Adjusted R-Square		.1368		.1815

*Significant at the 5% level.
**Significant at the 1% level.

Male respondents report a higher proportion of people worked around as the percent female in the group increase. For example, a male respondent in a group of 11 males and one female (group size of 12, percent female of .08) would report that his group works around one fewer member than an otherwise similar group of five males and seven females. Female respondents, however, report no change in the incidence of work around as the percent female in group changes.

The size of the group exerts a significant negative influence on the percent of the group worked around. Increasing the average group by 10 members would decrease the percent of the group worked around by 3 percentage points.

Supervisor quality is estimated to reduce the dependent variable. Changing the supervisor quality index (5-point scale) by 1 point would inversely change the percent of group members worked around by 4.29 percentage points in groups with a work around problem.

Finally, there appear to be no differences in the conditional work around problem by sex of the supervisor or by functional area.

Group Characteristics. Groups with a single female without a dependent or a military member with a civilian spouse (with or without a dependent) work around fewer people than other groups, if both have a work around problem.

Groups with officers or civilians work around fewer of its members than do groups with all enlisted members, given that a work around problem exists. Pace decreases and stress and shortages increase the conditional work around problem.

Individual Characteristics. Respondents with some college experience report a significantly more widespread conditional work around problem than those who only completed high school, trade, or technical school. The difference, however, is slight, as respondents with a college background report working around 1.42 percent more group members, as estimated by Model 1.

Unreported regression models included the sex of the supervisor interacted with the sex of the respondent, the percent female interacted with size, and also tested for non-linear percent female effects, but these specifications contributed little explanatory power.

8.3.4 Reasons For Work Around

The survey asked the respondents to list the main reason for any work around problem that they cited. The results from these questions are listed in Table 8-14.

The three main reasons for both male and female work around problems are: (1) the person is lazy, (2) the person lacks the ability or the aptitude, and (3) the person has not had time to learn the job. These three reasons account for 82.4% of those that listed a reason for any male work around and 58.4% of the reasons given for any female work around. Health reasons, a lack of strength, scheduling difficulties due to family or personal reasons, and missing too much work are more important reasons for female than male work around problems. Laziness and an alcohol or drug problem are more frequently cited for male than female work around problems. Finally, 4.1% of the respondents cited pregnancy-related reasons as causing the female work around problem in their work group.

TABLE 8-14

MAIN REASON FOR MALE AND FEMALE WORK AROUND PROBLEM
(Percentages*)

Reason	Male Work Around**	Female Work Around***	Row Average
Lack of Ability or Aptitude	12.5	14.0	12.9
Laziness	60.6	36.0	53.7
Temporary Health Problem	1.1	2.3	1.4
Long-term Health Problem	.7	1.0	.8
Drinking/Drug Problem	1.1	.2	.8
Lack of Strength	.5	7.0	2.3
Misses Too Much Work	.9	3.0	1.5
Not Enough Time to Learn Job	9.3	8.4	9.0
Scheduling Conflicts-Outside Job	.4	.3	.4
Scheduling Conflicts-Family/Personal	3.0	4.3	3.4
Pregnant-On the Job	.0	3.3	.9
Pregnant-Off the Job	.0	.8	.2
AF Restriction on Women	.0	2.0	.6
Other	9.9	17.6	12.1

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**These percentages are based on the 5,201 people who stated that their work group had experienced a male work around problem and whose data on the main reason was not missing.

***These percentages are based on the 2,171 people who stated that their work group had experienced a female work around problem and whose data on the main reason was not missing.

8.3.5 Interview Results On Work Around

From the sample of enlisted personnel responding to the written survey, a subsample of 801 people were personally interviewed to provide further insight. If the respondent had marked that his or her work group had either a male or female work around problem, then he or she also answered the following questions (once for each affirmative reply):

9. & 12.
How does your work group handle this kind of problem? (free-form response)

10. & 13.
How much is this a problem in getting the work done in your work group? (5-point scale ranging from a very serious problem to no problem at all)

The results from these questions are listed in Table 8-15.

The table indicates that more males than females report that female work around is a serious or very serious problem, while more females than males find the male work around problem to be serious or very serious. However, the females are very consistent in their reporting of a problem, whereas the males' rating of the problem is quite sensitive to gender. Males rank the female work around problem as serious or very serious more than twice as often as they do for male work around. Females, conversely, report the male and female work around problem as serious or very serious at about the same rate.

TABLE 8-15

SERIOUSNESS OF WORK AROUND PROBLEM
(Personal Interview Data)

Response	Male Work Around[a] M	Male Work Around[a] F	Female Work Around[b] M	Female Work Around[b] F	Row Average
Very Serious Problem	2.6	6.3	4.7	11.4	4.2
Serious Problem	9.1	12.5	22.4	11.4	12.2
Moderate Problem	33.1	32.5	29.4	22.9	31.6
Slight Problem	44.4	40.0	31.8	34.3	40.6
No Problem	10.9	8.8	11.8	20.0	11.4

[a] Figures are percentages based on the 355 reported cases of a male work around problem (excluding those with missing data).

[b] Figures are percentages based on the 120 reported cases of a female work around problem (excluding those with missing data).

Table 8-16 shows that in many of the cases, the problem is recurrent. On average, one-third of the work around problems continue without resolution. The two solutions most often cited are shifting the work to others and giving the individual who causes the problem motivation or counselling. Approximately three-quarters of all problems are left unresolved or handled in either of these manners. An interesting gender difference is that men consistently report that the solution to the problem results in an increased workload for the rest of the group. For both male and female work around problems, men are more likely to report that the work was shifted to other workers or the source of the problem was reassigned to a less demanding task in the work group. Males report that the problem was solved in this manner 29.5% of the time while only 20.9% of the females said that the resolution of the problem spilled over to the rest of the group.

TABLE 8-16

RESOLUTION OF MALE AND FEMALE WORK AROUND PROBLEMS
(Percentages*)

	Male Work Around**		Female Work Around***		Row Average
Response (Sex of Respondent)	M	F	M	F	
Nothing done-no reason	24.6	26.6	37.5	33.3	27.8
Nothing done-supervisor is problem	3.6	11.4	3.8	2.8	4.9
Nothing done-favoritism	0.0	3.8	0.0	0.0	0.6
Shift work to others	23.2	20.3	26.3	6.7	2.7
Provide more training	7.6	6.3	3.8	1.1	7.0
Increased supervision	4.7	2.5	1.3	2.8	3.6
Discipline from supervisor	6.9	2.5	0.0	2.8	4.7
Motivation or counselling	21.7	21.5	10.0	9.4	19.5
Reassign worker	4.7	1.3	8.8	2.8	4.7
Other	2.9	3.8	8.8	8.3	4.5

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*Cell percents are calculated separately for each population subgroup defined by row-column combinations. Percentages are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

**Percentages are based on the 355 reported cases of a male work around problem (excluding those with missing data).

***Percentages are based on the 116 reported cases of a female work around problem (excluding those with missing data).

8.4 FACTORS AFFECTING GROUP PERFORMANCE

The results of the preceding analyses are viewed in relation to the range of problems affecting work groups. Enlisted survey respondents were given a list of 17 factors and were asked to evaluate each on a 5-point scale ranging from "Very Serious Problem" to "No Problem At All," and were asked to select the factor out of the 17 which, in their opinion, is the biggest problem in terms of mission accomplishment.

Table 8-17 displays, for each factor, the percentage of enlisted personnel who ranked it as the most important problem facing his or her work group.[20] Factors are collected into three categories to suggest the primary locus of control (although a precise delineation is not possible): (1) problems originating from outside the group, (2) problems involving group members, and (3) problems related to group demographic characteristics. For example, equipment and personnel shortages could be described as problems confronting work groups, rather than problems caused by groups. In contrast, morale and supervision problems reflect group dynamics and personnel quality, although the work environment may intensify problems. The table presents the relative rankings separately by sex to highlight similarities and differences in the opinions of men and women.

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[20] The frequency with which each factor is cited as the most important problem corresponds closely with the frequency with which each factor was evaluated as a "Very Serious Problem" when respondents ranked each separately earlier in the questionnaire. This internal consistency bolsters our confidence in the collected data.

TABLE 8-17

MAIN FACTOR AFFECTING GROUP PERFORMANCE, ENLISTED PERSONNEL
(Column Percentages*)

	Sex of Respondent		Row Total
Main Factor	Male	Female	
External			
Equipment/Supply Shortage	12.1	7.3	11.6
Personnel Shortage	13.2	13.8	13.3
Too Much Red Tape	14.7	9.0	14.1
Personnel Leaving/Entering	4.9	6.5	5.1
Poor Working Conditions	10.0	8.8	9.4
Group			
Low Morale	17.4	22.7	18.0
Poor Supervision	9.9	11.3	10.1
Inadequate Skills/Training	7.2	8.0	7.3
Don't Work Hard Enough	5.8	8.6	6.2
Alcohol or Drug Abuse	1.5	1.0	1.5
Absenteeism	.6	.7	.6
Gender/Family Related			
Men in the Work Group	.1	.8	.2
Women in the Work Group	.8	.3	.8
Single People w/Dependents	.2	.2	.2
Married People w/Dependents	.3	.3	.3
Pregnancy	.9	.5	.9
People w/o Enough Strength	.4	.2	.4
Percent of Total	88.6	11.4	100.0

*Percentages are rounded to the nearest tenth, which affect the average and summed values. Statistics are based on self-reported survey data, weighted to correct for the oversampling of females.

In general, enlisted males and females are in agreement as to the most and least important factors affecting group performance. The biggest problems from the perspectives of both men and women are (overall percentages in parentheses):

- **External Factors (38.7%)**
  - Equipment and supply shortages (11.6%)
  - Personnel shortages (13.3%)
  - Too much red tape and paperwork (14.1%)

- **Group Factors (43.7%)**
  - Low morale (18.0%)
  - Poor supervision (10.1%)
  - People with inadequate skills or training (7.3%)
  - People who do not work hard enough (6.2%)

As seen in Table 8-17, women more than men point to problems related to morale, supervision, and workers' skills and industriousness. On the other hand, men are more likely to cite external problems, equipment shortages and red tape, more frequently than women. Of interest is that both men and women point to the opposite sex as a problem area more frequently than to their own. Also, men are more likely than women to mention pregnancy and insufficient strength as a group liability.

Enlisted personnel consider gender and family-related factors to be less important than other factors that adversely affect unit and group performance. Among the enlisted population, 2.9% point to a gender or family situation as the most important problem affecting group performance.

8.5 SUMMARY

Although gender-related issues may not be the most important factors affecting performance, the analysis does uncover important relationships between group performance and a set of individual and group characteristics, including gender and family status factors. Group performance is defined by:

- Group mobility;
- Group morale; and
- The likelihood and extent of work around problems.

In general, the measures of group performance are quite sensitive to the composition of the work group and characteristics of the work place, but relatively insensitive to individual characteristics.

Group Mobility. An estimated 37.6% of the Air Force believe that all and 47.9% believe that most of their work group could deploy quickly, with groups in nontraditional (for women) functional areas being able to deploy more rapidly than groups in traditional areas.

The multivariate analysis finds that the percent female in the group has a significant negative effect on a group's mobility, especially in nontraditional areas. The likelihood of a group's deploying all of its members quickly is estimated to decrease with group size. Supervisor quality increases the probability that a group can deploy all of its members quickly.

The sex of the supervisor, the sex of the respondent, and, in general, the functional area of the group have no effect on the dependent variable.

Groups with members who are responsible for dependents or members with little military experience are associated with low levels of mobility.

The pace of the job is positively related, and stress and shortages on the job are negatively related to the dependent variable.

In general, individual characteristics explain little of the variation in group mobility.

Group Morale. In general, Air Force enlisted personnel report that their group produces high quality work and functions well together. Group size negatively influences group morale, mainly through its interactive effect with percent female in traditional areas. This effect is small, except for very large groups with a high concentration of women. Neither the sex of the group's supervisor nor the percent female in the group has a pronounced effect on the dependent variable. Finally, supervisor quality is strongly correlated with group morale. However, it is not possible to discern a causal relationship from the data, because both group morale and quality of the group's supervisor are measured subjectively by the same source -- the survey respondent.

Groups with a member of a military marriage with dependents and groups composed of less experienced members have relatively low morale. Groups that work on evening shifts have high morale, while changing crews have low morale. A group's morale increases with pace and decreases with stress and shortages.

Respondents with eight or more years of service and those who are supervisors report high group morale.

Work Around. Almost half of all work groups in the Air Force are estimated to have a work around problem; about 14% of the Air Force enlisted population is worked around.

The multivariate analysis finds that members of mixed groups report more work around than all-male groups, but given that a work around problem exists, males in mixed groups report the problem is less widespread than either females or males in all-male groups.

The size of the group increases the probability of work around, both directly and indirectly, through its interaction with the percent female in the group. The interaction implies that raising the percent female in groups of fewer than 13 members reduces the probability of work around, but increases it in larger groups. The group size and percent female effects are not the same on the conditional work around problem, however. The size of the group decreases the number of people worked around, given that this number is positive. The percent female in a group accentuates an existing work around problem for male respondents, but it has no effect on female respondents.

Supervisor quality decreases both the likelihood of a work around problem and the extent of any problem that exists. The sex of the supervisor has no effect, except that groups with female supervisors in nontraditional areas (for women) are associated with a lower probability of work around than are groups with male supervisors in this area.

Although functional area does not affect work around, many group characteristics are important predictors of the existence and extent of the problem. Groups with a military member with a military spouse and dependent are more likely to have a work around problem than groups with all single males. Having a single woman with a dependent in the group increases the percentage of members worked around. Groups with a military member married to a civilian are associated with both a high probability of a problem and a high percentage of members worked around.

Having a high percentage of junior enlisted members increases the likelihood of a problem, while having officers or civilians in the group decreases the extent of any existing work around problem. Finally, pace decreases, and stress and shortages increase both the likelihood and incidence of work around problems.

9. SEXUAL HARASSMENT

Harassment of any type may disrupt the flow of work, create a tense environment, and undermine morale. It may also lessen an individual's commitment to his or her group as well as to the Air Force. The Survey of Work Groups queried respondents on both the incidence and resolution of verbal and physical harassment that they experienced from other members of their work group because of their sex.

The analysis focuses on self-reported verbal and physical harassment of female enlisted personnel. This focus is consistent with the study's overall objective of examining the effects of women in the Air Force. Because the number of episodes of sexual harassment rises with the number of women (who are potential targets), it is important to analyze its principal correlates.

To place the issue of sexual harassment in perspective, this chapter begins with a descriptive overview of reported incidents for both men and women. Next, multivariate analysis is used to explain variation in the occurrence of reported harassment for women. Finally, tabular analysis is used to see how men and women have resolved the problem of sexual harassment.

The survey presented respondents with four questions concerning the incidence and resolution of sexual harassment by members of their work group.

91. In the last four weeks of work, have you personally been the victim of verbal harassment or abuse because of your sex (for example, sexist jokes, offensive cursing) by anyone in your work group?

A. Yes, 1 time
B. Yes, 2 times
C. Yes, 3-4 times
D. Yes, 5-6 times
E. Yes, 7 or more times
F. No (SKIP to Q.93)

93. In the last four weeks of work, have you personally been the victim of physical harassment because of your sex (such as inappropriate physical contact) by anyone in your work group?

A. Yes, 1 time
B. Yes, 2 times
C. Yes, 3-4 times
D. Yes, 5-6 times
E. Yes, 7 or more times
F. No (SKIP to Q.95)

92. & 94. How did you solve the problem? (MARK THE ONE BEST ANSWER).

A. I did not, the problem continues
B. Did nothing and the problem went away
C. Talked to the person(s) causing the problem
D. Talked with my work group supervisor
E. Talked about the problem with a friend
F. Talked about the problem with my spouse
G. Talked to a counselor or chaplain

Caveat. An important qualification to the following analysis is that the severity of self-reported harassment is very difficult to interpret. Individuals differ in their perceptions of what constitutes sexual harassment. Using a written questionnaire to collect information on the incidence of harassment does not yield objective measures of the frequency and severity of sexual harassment. In light of this inherent data limitation, the most appropriate objective of the empirical analysis is to isolate systematic patterns in harassment by personal and group characteristics. Thus, the tabular and regression findings should not be construed as accurate indicators of the magnitude of sexual harassment because of unknown measurement errors imbedded in the survey responses.

9.1 DESCRIPTIVE ANALYSIS

Table 9-1 shows the distribution of reported verbal and physical harassment by gender. Overall, 6.6% of the male respondents report at least one case of verbal harassment in the last four weeks. For females, the incidence is substantially higher at 26.7%. Table 9-1 estimates the occurrence of physical harassment to be roughly one-quarter the magnitude of verbal harassment. However, the frequency of physical harassment for women remains four times that for men. This ratio between women and men also holds for verbal harassment.

Table 9-2 presents the frequency of verbal harassment occurring at least once, broken down by gender and percent female in the work group. Focusing first on verbal harassment, the table shows that its incidence among females declines as the proportion of females in the work group increases. In contrast, there is only a minor fluctuation among males. The decrease for women suggests a systematic relationship between verbal harassment and the proportion of females in the work groups. The same pattern also appears for females with respect to physical harassment. This tabular analysis suggests that raising the proportion of females in a work group decreases the incidence of sexual harassment among females.

Tables 9-1 through 9-2, however, do not shed light on the characteristics of women who tend to report higher levels of harassment, or whether the incidence of harassment varies substantially by other measurable work group characteristics such as group size, sex of the supervisor, or functional area. The effects of these and other factors are examined by the multivariate analysis. However, as a first attempt at determining areas where the likelihood of harassment is the highest, Tables 9-3 and 9-4 present the incidence of verbal and physical harassment by gender and functional area.

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TABLE 9-1

REPORTED SEXUAL HARASSMENT IN THE LAST 4 WEEKS, BY INCIDENCE AND SEX
(Column Percentages*)

A. VERBAL

Incidence In Last 4 Weeks	Sex of Respondent Male	Female	Row Average
1 Time	1.3	3.4	1.5
2 Times	1.2	5.1	1.6
3-4 Times	1.5	7.6	2.2
5-6 Times	0.7	2.4	0.9
7+ Times	2.0	8.2	2.7
None	93.4	73.3	91.1

B. PHYSICAL

Incidence in Last 4 Weeks	Sex of Respondent Male	Female	Row Average
1 Time	.5	2.7	.7
2 Times	.4	1.7	.5
3-4 Times	.5	.9	.5
5-6 Times	.2	.3	.2
7+ Times	.3	.7	.4
None	98.3	93.8	97.8

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*Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

TABLE 9-2

REPORTED SEXUAL HARASSMENT IN THE LAST 4 WEEKS, BY PERCENT FEMALE AND SEX (Percentages*)

A. VERBAL

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
F = 0	5.6	-	5.6
0 < F < .15	7.9	39.8	10.8
.15 ≤ F < .30	6.7	31.4	11.6
F ≥ .30	8.1	19.7	12.3
Column Average	6.6	26.6	8.9

B. PHYSICAL

Proportion of Females in Work Group (F)	Sex of Respondent Male	Female	Row Average
F = 0	1.5	-	1.5
0 < F < .15	2.0	9.7	2.7
.15 ≤ F < .30	1.7	6.7	2.6
F ≥ .30	2.2	4.4	3.7
Column Average	1.7	6.2	2.2

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

TABLE 9-3

REPORTED VERBAL HARASSMENT IN THE LAST 4 WEEKS, BY FUNCTIONAL AREA AND SEX
(Percentages*)

Functional Area	Sex of Respondent Male	 Female	Row Average
Civil Engineering	8.7%	30.6	9.9
Comptroller	5.5	15.2	7.9
Depot Ops. & Maint.	5.0	24.3	6.7
Grd.Comm., Elec.Ops. & Maint.	5.1	29.6	7.7
Intelligence	6.1	24.9	9.6
Medical	7.7	21.1	11.5
Operations-Flight	5.5	28.4	7.7
Manpower & Personnel	4.2	26.0	9.4
Research & Development	3.1	25.1	5.7
Security Police	7.4	40.4	8.8
Supply, Services, & Contracting	8.0	29.6	11.9
Training	7.2	25.1	9.5
Transportation	8.2	21.2	9.7
Weapons Sys. Maint.	6.2	32.7	7.8
Admin., Command, & Other	5.6	21.0	9.0
Column Average	6.5	26.6	8.9

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

TABLE 9-4

REPORTED PHYSICAL HARASSMENT IN THE LAST 4 WEEKS, BY FUNCTIONAL AREA AND SEX
(Percentages*)

Functional Area	Sex of Respondent Male	 Female	Row Average
Civil Engineering	1.9	8.3	2.3
Comptroller	1.9	3.5	2.3
Depot Ops. & Maint.	1.4	17.6	2.9
Grd.Comm., Elec.Ops. & Maint.	1.3	8.9	2.2
Intelligence	1.5	2.5	1.7
Medical	3.3	5.4	3.9
Operations-Flight	0.9	2.7	1.0
Manpower & Personnel	1.6	5.5	2.6
Research & Development	1.8	12.5	3.1
Security Police	1.8	9.1	2.1
Supply, Services, & Contracting	2.0	6.8	2.9
Training	1.1	9.7	2.2
Transportation	1.1	3.2	1.3
Weapons Sys. Maint.	1.7	6.8	2.0
Admin., Command, & Other	1.6	4.6	2.2
Column Average	1.7	6.2	2.2

*Cell percents are calculated separately for each population subgroup, defined by row-column combinations. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

Table 9-3 reveals substantial variation in the incidence of verbal harassment across functional area after controlling for sex. However, because many of these proportions are based on small sample cell sizes, care must be taken in interpreting their significance.[1] To illustrate this point, the following example presents the estimated proportion, standard deviation, and 95% confidence interval for verbal harassment among females by selected functional area.

ESTIMATED CONFIDENCE INTERVALS FOR VERBAL HARASSMENT AMONG FEMALES, BY SELECTED FUNCTIONAL AREA
(See Table 9-3)

Functional Area	Estimated Mean	Standard Deviation	95% Confidence Interval
Comptroller	.152	.0331	.086 - .218
Intelligence	.249	.0409	.167 - .331
Operations-Flight	.284	.0421	.200 - .368
Security Police	.404	.0604	.283 - .525

The above examples demonstrate why Tables 9-3 and 9-4 must be interpreted carefully before forming conclusions about differences in sexual harassment by functional area because of the overlapping confidence intervals.

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[1] Sample cell sizes by functional area and sex are presented in Table 5-5.

TABLE 9-5

PROBABILITY OF SEXUAL HARASSMENT IN LAST 4 WEEKS
(Female Respondents)

Variable Name	Verbal Estimated Coefficient	Verbal t - Ratio	Physical Estimated Coefficient	Physical t - Ratio
INTERCEPT TERM	.4729	7.53**	.1097	3.04*
KEY CHARACTERISTICS				
PERCENT FEMALE IN GROUP	-.0449	-1.14	.0047	.21
GROUP SIZE	.0055	3.66**	.0027	3.21*
SUPERVISOR QUALITY INDEX	-.0989	-9.13**	-.0257	-4.14**
FEMALE SUPERVISOR (Male)	.0001	.01	.0042	.29
GROUP SIZE-PERCENT FEMALE INTERACTION	-.0152	-2.93*	-.0101	-3.38**
FUNCTIONAL AREA (Supply, Services, Contracting)				
Civil Engineering	-.0843	-1.44	-.0093	- .28
Comptroller	-.0683	-1.38	-.0136	- .48
Depot Ops. & Maint.	-.0479	- .53	.0824	1.59
Grd.Comm., Elec.Ops. & Maint.	.0238	.49	.0386	1.39
Intelligence	-.0120	- .21	-.0284	- .88
Medical	-.0010	- .02	.0097	.35
Operations-Flight	.0007	.01	-.0316	-1.05
Manpower & Personnel	.0639	1.34	.0050	.18
Security Police	-.0333	- .51	-.0315	- .83
Training	-.0015	- .03	.0351	1.18
Transportation	-.0970	-1.86	-.0574	-1.92
Weapons Sys. Maint.	-.0273	- .71	-.0277	-1.27
R&D, Admin., Command, & Other	-.0314	- .37	-.0030	- .14

(continued)

TABLE 9-5

PROBABILITY OF SEXUAL HARASSMENT IN LAST 4 WEEKS
(Female Respondents)

Variable Name	Verbal		Physical	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
GROUP CHARACTERISTICS				
WORK STRESS (Not Very Stressful)				
Very stressful	.0673	2.07	.0149	.80
Somewhat stressful	.0167	.70	.0080	.58
Not at all stressful	-.0666	-2.12	-.0124	- .69
WORK PACE (Neither Fast Nor Slow)				
Very fast	-.0545	-1.88	-.0089	- .53
Somewhat fast	.0004	.02	.0236	1.72
Somewhat or very slow	.0957	3.12*	-.0024	- .14
WORK GROUP TYPE				
Changing crew (No)	.0417	.84	.0054	.19
Supervisor of supervisor (No)	-.0147	- .20	.0338	.82
WORK SCHEDULE (Day Shift)				
Evening shift	-.0263	- .62	.0209	.86
Midnight shift	.0372	.58	.0636	1.72
Extended or irregular hours	.0110	.28	.0202	.89
RANK COMPOSITION				
At least 1 civilian (No)	-.0125	- .59	.0043	.35
At least 1 officer (No)	-.0189	- .87	.0028	.23
RELATIVE EXPERIENCE (Ratio of E1-3 to All Enlisted)	-.0116	- .29	.0087	.37
ENVIRONMENT INDEX (Outdoors & Hazardous & Extreme Temp.)	.1469	3.72**	.0157	.69
PHYSICAL INDEX (Strength Required & Dirty Work)	.0175	1.91	.0000	.00
ANY SHORTAGES LAST WEEK				
Equipment shortages (No)	.0710	3.56**	.0309	2.70*
Personnel shortages (No)	.0757	3.95**	.0243	2.22

(continued)

TABLE 9-5

PROBABILITY OF SEXUAL HARASSMENT IN LAST 4 WEEKS
(Female Respondents)

Variable Name	Verbal		Physical	
	Estimated Coefficient	t - Ratio	Estimated Coefficient	t - Ratio
INDIVIDUAL CHARACTERISTICS				
RACE (Nonblack, NonHispanic)				
Black	-.0025	- .11	.0142	1.08
Hispanic	-.0213	- .45	.0194	.71
EDUCATION (High School, Trade, or Technical School)				
Less than high school, or GED	-.0153	- .29	.0724	2.36
Some college and beyond	.0487	2.51*	.0024	.22
FAMILY MEMBER PREGNANT (No)	-.0088	- .25	.0293	1.45
YEAR OF SERVICE (YOS 4-7)				
YOS < 4	.0733	3.23**	-.0004	- .03
YOS 8 and beyond	-.0145	- .53	-.0057	- .36
AFSC GROUP (Support, Admin.)				
Elec./Mech. Equip. Repair	-.0198	- .56	.0002	.01
Craftsmen and Services	.0477	1.14	.0039	.16
Skilled Technicians	-.0224	- .69	-.0083	- .45
WORKED > 40 HRS LAST WEEK (No)	.0156	.73	.0324	2.64*
LIVE ON BASE (No)	.0134	.68	.0110	.97
RESPONDENT A SUPERVISOR (No)	-.0500	-1.83	-.0212	-1.35
MARITAL STATUS (Single)				
Married, military spouse	-.0440	-2.09	-.0421	-3.49**
Married, civilian spouse	-.0184	- .65	.0126	.78
Sample Size	2,166		2,140	
Mean of the Dependent Variable	.2690		.0617	
F-Statistic	7.68		2.94	
Adjusted R-Square	.1359		.0443	

*Significant at 5% level.
**Significant at 1% level.

These tables do, however, suggest that certain functional areas may experience relatively high and low incidences of sexual harassment. These findings raise two questions:

- Whether there are measurable characteristics of work groups and individuals in these functional areas that explain this observed pattern of harassment; or
- Whether the incidence of harassment is the same across all groups in each functional area.

The multivariate analysis investigates this possibility by controlling for a number of personal and group characteristics in the regression models. Some of the included characteristics may be correlated with both harassment and specific functional areas. If so, then controlling for these factors should reduce or eliminate the importance of functional area as an estimated determinant of harassment.

9.2 MULTIVARIATE ANALYSIS

The estimated linear probability models for verbal and sexual harassment are presented in Table 9-5. Because the specifications are the same for both the verbal and physical harassment models, the results for the two dependent variables are presented side by side. The discussion first presents the results of the verbal harassment model followed by the findings on physical harassment. This organization reflects the greater success of the analysis in predicting the occurrence of verbal harassment.[2]

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[2] In general, the regression model is unable to explain the incidence of physical harassment using data collected by the Survey of Work Groups.

The dependent variable for the verbal and physical harassment models are based on Questions 91 and 93, respectively, of the survey. The analyses focus on the presence or absence of sexual harassment and how it varies systematically with respect to other factors. Hence, the dependent variable for each regression equation is defined as 1 if the respondent indicated at least one incident of harassment in the last four weeks, and 0 otherwise.

Key Characteristics. Both the verbal and physical harassment models indicate that group size, supervisor quality, and the interaction of group size and percent female are significant determinants of harassment. The estimated coefficients and associated t-ratios for each of these key characteristics are reproduced below.

KEY CHARACTERISTICS

PROBABILITY OF A WOMAN REPORTING SEXUAL HARASSMENT

Variable	Verbal Estimated Coefficient	Verbal t-Ratio	Physical Estimated Coefficient	Physical t-Ratio
Group Size	.0055	3.66**	.0027	3.21*
Supervisor Quality Index	-.0989	-9.13**	-.0257	-4.14**
Group Size x Percent Female	-.0152	-2.93*	-.0101	-3.38**
Mean of Dependent Variable		.269		.062

*Significant at the 5% level.
**Significant at the 1% level.

The positive relationship estimated between group size and both verbal and physical harassment suggests two complementary interpretations. First, as group size increases, so does the number of potential offenders (for a given male-female mix). If the probability of a man harassing a woman remains constant (no change in individual behavior), then a bigger group would lead to a proportionate increase in the episodes of sexual harassment. Second, in larger groups the opportunity for establishing close interpersonal relationships and cohesion may be more difficult. This condition implies that individual behavior may be sensitive to group size and that the probability of a man's harassing a woman would actually be greater in larger groups.

The magnitude as well as significance of supervisor quality as a determinant of sexual harassment is important. The coefficient of -.0989 means that for every unit increase in the 5-point index, the probability of verbal harassment declines by 10 percentage points. Thus, an individual who evaluates her supervisor at the sample mean of 3.5 has a predicted probability of verbal harassment that is 24.7 percentage points lower than an otherwise similar woman who assigns a rank of 1 to her supervisor.

Ascribing causality to the verbal harassment-supervisor relationship is problematic because of possible endogeneity between supervisor rating and reported harassment. Some victims of sexual harassment may place at least part of the blame on their group supervisor. In short, while the analysis suggests a strong relationship between harassment and supervisor quality, the possible endogeneity of the relationship suggests that the safest conclusion is that supervisor quality should be considered a strong correlate rather than a determinant of verbal and physical harassment.

The regression analysis also finds that group size and the density of women in the group have an interdependent effect on the incidence of harassment.[3] Specifically:

- The effect of a change in the proportion of females in a group on the probability of harassment depends on the size of the group. For verbal harassment this effect is determined by:

  -.0152 x Group Size.

- The effect of a change in group size depends on the proportion of females in the group. For verbal harassment this effect is determined by:

  .0055 - .0152 x Percent Female.

An example will help illustrate the importance of this interdependent effect. The example, presented graphically in Figure 9-1, calculates the predicted probability of verbal harassment, in response to selected changes in group size and percent female, for a hypothetical individual.[4] This "typical" individual has a predicted probability of verbal harassment of 15.32%.

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[3] The easiest way to calculate the magnitude of this effect is to solve for the partial derivatives of harassment with respect to size and percent female, and then evaluate these functions at values of interest.

[4] This "typical" individual is defined as someone in the omitted category for all significant categorical group characteristics, and with the mean value for all significant discrete or continuous characteristics (see Table 9-5).

FIGURE 9-1

PREDICTED PROBABILITY OF VERBAL HARASSMENT FOR SELECTED CHANGES IN GROUP SIZE AND PERCENT FEMALE

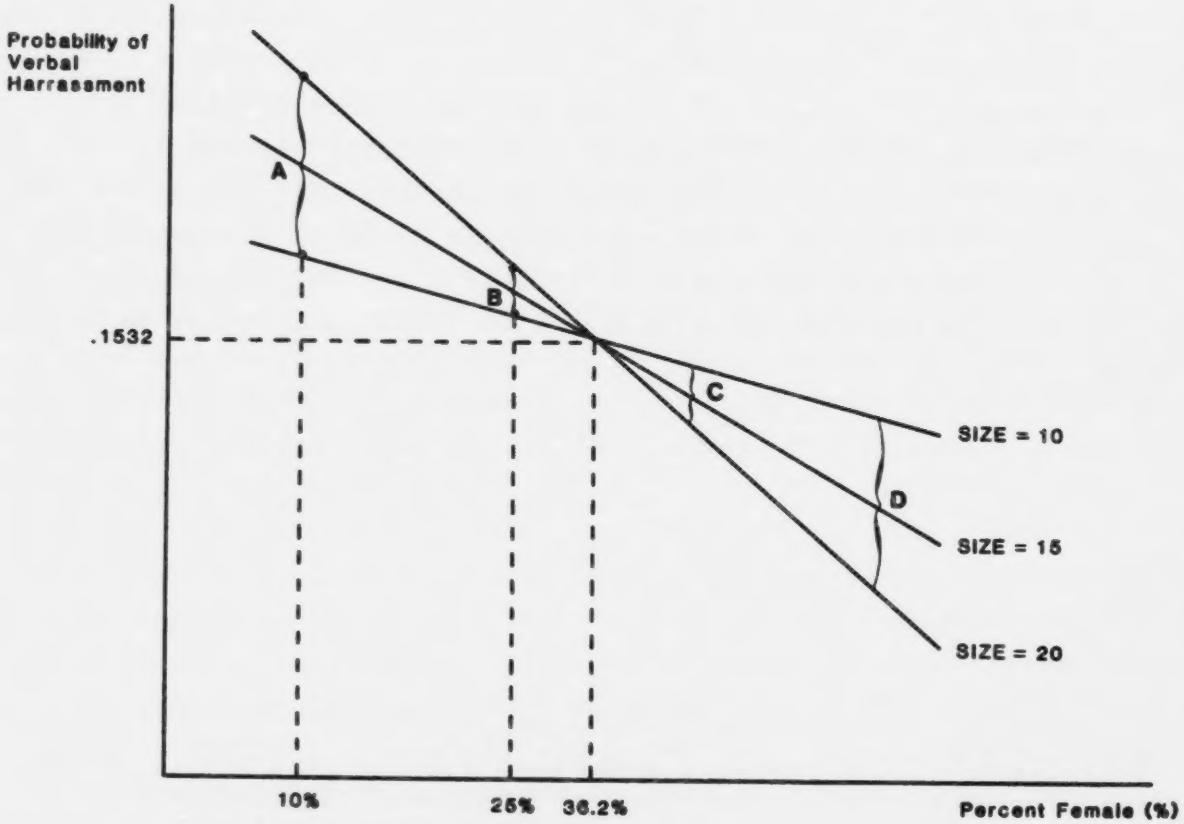

Figure 9-1 reveals three important findings concerning the interdependent effect of group size and percent female on the probability of verbal harassment. First, changes in group size have a smaller effect on predicted harassment as percent female approaches the cross-over point of 36.2%. This finding is true and of equal magnitude if the percent female is greater than _or_ less than 36.2%. For example, reducing group size from 20 to 10 reduces the probability of verbal harassment by 3.98 percentage points (A = .2328 - .1930) if females make up 10% of the group. If the proportion of females is 25%, however, the same reduction in group size decreases verbal harassment by only 1.7 percentage points (B = .1872 - .1702).

Second, for groups with more than 36.2% women, changes in group size have the opposite effect. In this case, reducing group size from 20 to 10 _increases_ the probability of harassment. And the size of this increase is larger the higher the proportion of females (D > C). Thus, for percent female above 36.2% an increase in group size _decreases_ verbal harassment, while for groups with a proportion of women less than 36.2% an increase in group size _increases_ the probability of harassment.

Third, for a given group size, an increase in the proportion of females will _always_ _decrease_ the incidence of verbal harassment. Moreover, the magnitude of the decrease in harassment due to an increase in the proportion of females increases with group size. This finding is illustrated in Figure 9-1 by the steeper slope for larger groups.

After controlling for group and individual characteristics, the multivariate analysis finds that functional area ceases to have a statistically significant independent effect on the probability of sexual harassment. These results confirm that it is not functional area _per se_ that explains variation in the probability of harassment. As indicated in the discussion below, it is the characteristics of work groups in functional areas that are associated with verbal harassment. The regression findings, in conjunction with the tabular results, imply that characteristics associated with high and low harassment are likely to be clustered in selected functional areas.

Group Characteristics. The regression results presented in Table 9-5 point to several work group factors that play a significant role in predicting the probability of verbal harassment. These include:

- Pace of work;
- Environment of the work place;
- Incidence of personnel shortages; and
- Incidence of equipment shortages in the group.

These factors are important determinants of verbal harassment because of their magnitude as well as their significance. Moreover, the correlation between these work place characteristics and specific functional areas produces the observed patterns in harassment by functional area noted in the descriptive analysis.

Females working in groups with a "somewhat slow" or "very slow" work pace are 9.6 percentage points more likely to report an incident of verbal harassment than women in faster paced groups. This finding is consistent with the results of previous chapters that show that a slow work pace is linked to lower group morale, higher probability of work around, stronger desire to transfer out of the group, and greater desire to leave the Air Force early. However, the pace of work does not have a significant effect on the probability of physical sexual harassment.

The regression analysis positively links the probability of verbal harassment to the work environment index (hazardous conditions, working outdoors, and exposure to extreme temperatures). Personnel and equipment shortages are also estimated to be positively related to the incidence of verbal harassment. Individuals reporting equipment and personnel shortages in the last week are 7.1 and 7.6 percentage points, respectively, more likely to report an incidence of verbal harassment. One explanation for these correlations is that equipment or personnel shortages and unpleasant working conditions create a tense atmosphere that is not conducive to group harmony. With respect to physical harassment, the only group characteristic estimated to have a significant effect is the occurrence of equipment shortages.

Individual Characteristics. Two individual characteristics are found to be positively related to the incidence of reported verbal harassment. Women with at least some college education are 4.5 percentage points more likely to cite an incidence of verbal harassment than other women. While more educated women may, in fact, be exposed to greater verbal harassment, the findings may also imply that better educated women have a more encompassing definition of verbal harassment and therefore tend to report it more frequently than others.[5]

The other individual characteristic estimated to have a significant effect on the probability of verbal harassment is YOS less than 4. Women in their first term are predicted by the regression model to be 7.3 percentage points more likely to report an incident of verbal harassment than women at YOS 4 and beyond. This YOS effect may be a proxy for youth and inexperience, or it may reflect the reactions of first-term women to military life.

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[5] An unpublished study by Charles C. Moskos, "Female GIs In The Field; Report From Honduras", Northwestern University, January 1985, suggests that better educated females are more likely to perceive sexual harassment and, hence, are more likely to consider a given situation as sexual harassment than are their less educated counterparts.

The analysis of the probability of physical harassment finds only two individual characteristics that are statistically significant. Women working over 40 hours in the last week are 3.2 percentage points more likely to report physical harassment than those working a normal work week. This finding is consistent with the notion that individuals working overtime are (1) at risk for longer periods, and (2) exposed during higher-risk periods (e.g., at night, on weekends). Second, women with a military spouse are 4.2 percentage points less likely to report physical harassment than others.

9.3 RESOLUTION OF SEXUAL HARASSMENT

Table 9-6 shows how males and females reporting an incident of verbal or physical harassment deal with the problem. Among respondents reporting a harassment problem in the last 4 weeks, 18% to 28% claim that the problem still exists. With the passage of time, this percentage should fall as individuals continue to resolve their problems, especially those who experienced harassment shortly before the survey. Fourteen percent to 24% report that the "problem went away" without any corrective action. A positive sign is that 19% to 34% of those who experience either form of harassment report talking directly to the person responsible for the incident.

Direct confrontation with the person causing the problem is common for both males and females reporting harassment. However, men were more likely to discuss the problem of harassment with their spouse than were women. Talking to a friend, a counselor

TABLE 9-6

RESOLUTION OF HARASSMENT PROBLEM, BY SEX
(Column Percentages*)

A. VERBAL

Problem Resolution	Sex of Respondent Male	Female	Row Average
Problem Continues	21.3	28.1	23.1
Did Nothing; Problem Went Away	17.0	14.2	16.2
Talked to Person Causing Problem	19.0	29.8	21.9
Talked with Group Supervisor	5.4	7.6	6.0
Talked with a Friend	3.5	4.8	3.8
Talked with Spouse	32.2	13.7	27.2
Talked to Counselor or Chaplain	1.9	1.8	1.7

B. PHYSICAL

Problem Resolution	Sex of Respondent Male	Female	Row Average
Problem Continues	18.0	25.8	19.8
Did Nothing; Problem Went Away	23.9	15.5	21.9
Talked to Person Causing Problem	26.6	33.6	28.3
Talked with Group Supervisor	8.6	9.9	8.9
Talked with a Friend	6.2	8.5	6.7
Talked with Spouse	12.6	5.6	10.9
Talked to Counselor or Chaplain	4.2	1.2	3.5

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*Statistics are calculated for individuals reporting sexual harassmemt during the past four weeks. Statistics are rounded to the nearest tenth. Statistics are based on self-reported survey data that have been weighted to correct for the oversampling of females.

or chaplain, or the work group supervisor were the actions least often taken by affected respondents.[6]

9.4 SUMMARY

The analysis finds evidence to suggest that sexual harassment is a problem for certain enlisted Air Force women. Although the tabular analysis points to a pattern in verbal harassment by functional areas, the regression analysis finds that, after controlling for group characteristics, functional area is not the cause of fluctuations in the incidence of verbal harassment. Rather, it is a combination of work place factors and key characteristics such as the proportion of females in the work group and group size that influence the probability of verbal harassment.

Females reporting incidents of verbal harassment are significantly more likely to (1) be working in a poor environment (as measured by the Work Environment Index), (2) have a job that has a somewhat or very slow pace, and (3) be in a group experiencing equipment and personnel shortages. The analysis also finds a high measure of association between supervisor quality and reported harassment. However, the possible endogeneity between supervisor quality rating and reported sexual harassment makes interpretation of this finding difficult.

Regression analysis of the determinants of both verbal and physical harassment finds a significant relationship between group size, group size interacted with percent female, and the probability of harassment. These findings reveal that an increase in group size, holding the proportion of women in the work group constant, (a) increases the incidence of verbal harassment for groups composed of roughly less than one-third women, and (b) decreases the probability of verbal harassment for groups with over one-third women. However, for a given group size, an increase in the proportion of females decreases the probability of harassment, but at a slower rate for smaller than for larger groups.

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[6] It is unclear whether these forms of resolution constitute a continuation or cessation of harassment.

Individual characteristics do not appear to play a significant role in predicting the incidence of sexual harassment. The only two statistically significant personal correlates of verbal harassment are education and years of service.

Caveats. Two qualifications should be noted before turning to the reported resolution of verbal and physical harassment. First, what is considered sexual harassment varies from individual to individual, and from one situation to the next. Second, a reported incident of sexual harassment does not convey information on the degree of severity. Both the occurrence and the nature of sexual harassment are needed to evaluate its seriousness. Whether or not the Air Force has a noticeable sexual harassment problem requires additional study, starting with a comparison of the results of this analysis with estimates of harassment from the private sector as well as the other military services.

Among men and women reporting sexual harassment in the past four weeks, 14% to 24% report that the problem was solved without taking action. From 18% to 28% of all reported harassment remained unresolved within the four-week period. However, the percentages of unresolved cases, especially the most recent, should fall with the passage of time. About 19% to 34% of the problems were solved by respondents talking directly to the person responsible, which may be considered a healthy indicator of group relationships.

10. SENIOR OFFICERS INTERVIEW ANALYSIS

The findings in this chapter are derived from responses to the Senior Officers Interview, a part of the 1984 U.S. Air Force Survey of Work Groups. The general purpose of the Senior Officer Interview was to examine the key issues and problems of Air Force work groups from the commanding officer's perspective, including the effects of enlisted women on work group performance. Because the interview sample was not designed to represent all Air Force senior officers, the findings in this chapter should not be generalized to the senior officer population. The descriptive analysis presented below should only be used to provide the officers' insights into the enlisted survey results.

The NORC survey team interviewed two senior officers, usually wing commanders and deputy commanders for maintenance, from each of the 30 bases selected for the enlisted work group survey. The officers have served an average of 23.5 years in the Air Force and have been at their current bases, in their current positions, an average of slightly more than a year. The interview subjects are referred to in this chapter as the "respondents", the "officers", or "the senior officers". The interview was designed to last 30 minutes, but could have lasted longer depending on the length of the subject's response and the extent of the interviewer's probing.

10.1 ANALYSIS FOCUS

The interview guide used by the survey team consists of 29 questions that have been cast into three analysis areas. Each area includes one or more questions that either address similar aspects of enlisted women's effect on unit performance or provide similar types of information.

The first area focuses on the senior officers' ranking of the five most important factors that make it harder for units under their command to perform their missions. Officers were limited to 5 factors from a list of 13 (with room for "Other" responses). Although gender-related factors were included in the list, this area was not specifically tied to the topic of women in the Air Force. The intent was to see how issues related to gender rank relative to the senior officers' overall concerns.

In contrast to the first area, the second links overall unit performance to the presence of enlisted women. The data used were officers' ratings of the effect of women on the officers' units and the reasons they gave for the effect. Those who felt women had a negative effect were also asked to gauge its seriousness compared to the problem-causing factors they listed in the first analysis area.

In the third analysis area, data were collected on the officers' ratings of the effect of enlisted women across seven specific measures of performance and group dynamics: morale, day-to-day performance, number of incidents of sexual harassment, ability to deploy and mobilize, number of people needed to get the job done, number of discipline problems, and flexibility in assigning work. For each of the seven dimensions, the senior officers rated the effects given the current numbers of women in their units.

10.2 FACTORS THAT MAKE IT HARDER FOR A UNIT TO PERFORM ITS MISSION

Respondents chose, and ranked by their importance, at most 5 factors from a list of 13 that previous analysis showed commonly make it harder for a unit to perform its mission. Space was also provided for three factors the officers felt were significant enough to merit attention. Although factors related to women are included in the list, the questions in this area are not specifically tied to the issue of women's effect on the unit. Instead, the issues related to gender are viewed relative to the officers' overall concerns. The listed factors are:

1. Equipment/parts shortages
2. Insufficient manpower authorizations/personnel shortages
3. Personnel turnover
4. Inadequate training
5. Paperwork/red tape
6. Work group supervision
7. Single people with dependents
8. Married people with dependents
9. Married military couples
10. People with second jobs
11. Health problems, injuries

12. Pregnancy

13. Bad weather

14-16. Other

Factors 7, 8, 9, and 12 are combined into a single general "Family/Pregnancy" category because of the small number of responses. Some existing categories are expanded to accommodate related "Other" responses. For example, "Equipment/parts shortages" was broadened to include facilities problems, and overtasking is included in "Insufficient manpower authorizations/personnel shortages". Remaining factors that were clearly rewording or elaborations of existing factors were placed in their relevant categories. "Health problems, injuries" was dropped because there were no responses.

Table 10-1 shows the response distribution by category and rank for the first analysis area. This table shows that "Family/Pregnancy" makes up only 7.3% of the top five problems currently affecting unit performance. No one ranks it first, and only one officer ranks it second in importance. The most frequently cited problem areas are personnel factors, including the overtasking and turnover categories, at about 42% of total responses, and "Equipment/Parts Shortages" at 20%. The remaining responses are divided among other items not related to family status: 10% inadequate training, about 7% each paperwork/red tape and work group supervision, and about 6% bad weather. Equipment and personnel problems together account for 84% of all responses ranked first, 76% of all responses ranked second, and 57% of all responses ranked third.

These results show that, currently, few of the senior officers cite problems connected with family or pregnancy within the larger context of all factors affecting unit performance. Moreover, when family-related problems do arise, subjects perceive them to be less important relative to other problems with the Air Force in general and to their units in particular. The key message from these statistics is that resources seem to be the chief constraint that makes mission achievement more difficult at the current time. Other issues appear to be less important by a factor of 10.

TABLE 10-1

FACTORS THAT MAKE IT HARDER FOR A UNIT TO PERFORM ITS MISSION

	Rank (as percent of total responses)					
Factor	1	2	3	4	5	Row Percent
Personnel Shortage	9%	6%	3%	2%	1%	21%
Personnel Turnover	4	5	6	4	2	21
Equipment/Parts Shortage	8	6	4	2	0	20
Inadequate Training	1	2	3	2	2	10
Family/Pregnancy*	0**	0	2	2	3	7
Paperwork/Red Tape	0	1	2	1	3	7
Work Group Supervision	1	2	2	1	1	7
Bad Weather	2	0	2	2	1	7
TOTALS	25	22	24	16	13	100

*Combines "Single People with Dependents", "Married People with Dependents", "Married Military Couples", and "Pregnancy" factors.

**"0" categories have fewer than 1% of the responses.

10.3 THE EFFECT OF ENLISTED WOMEN ON UNIT PERFORMANCE

In contrast to the range of problem areas affecting unit performance, senior officers were asked specifically to consider the effect of enlisted women on getting the job done in the organizations for which they are responsible and to give reasons for their choices. They were not limited in the number of reasons they could give, and interviewers were instructed to probe for multiple responses. Those who said there was a negative effect were then asked to gauge its severity compared to other problems they faced. Table 10-2 shows the distribution for the first part of this analysis area -- the effect of enlisted women on unit performance.

TABLE 10-2

EFFECTS OF ENLISTED WOMEN ON UNIT PERFORMANCE
(Current Numbers of Women)

Effect	Percent of Senior Officers
Very Positive	8%
Somewhat Positive	27
Neither Positive Nor Negative Effect	50
Somewhat Negative	15
Very Negative	0
TOTAL	100

Table 10-2 shows that 35% of the officers believe enlisted women have a positive effect on unit performance. Of these, 8% believe the effect is very positive and 28% that it is somewhat positive. Fifteen percent say the effect of women on performance is somewhat negative and no one says it is very negative. Fifty percent of the officers believe enlisted women have neither a positive nor a negative effect. The most common reason given for this is that individual performance, not gender, is the more important factor in unit performance, and that women as individuals have performed as well, or better, than men. Thus, 85% of the officers interviewed believe women have either a positive or neither a positive nor a negative effect on performance. This is consistent with the findings in Section 10-2 where marital status, pregnancy, and dependent care problems were seen as less important relative to the other factors that cause problems for a unit.

Table 10-3 shows how the officers' reasons for positive and negative effects of women on unit performance are distributed. The most frequently cited reason for enlisted women's positive effect is that they enhance group performance or the work environment or both. More specifically, the officers believe that women either foster competitiveness or help create a more relaxed working atmosphere. The next most frequently cited reason is the women's strong motivation to perform well and their commitment to the job at hand. Some of the officers bolster their observations by noting that many of the women are, in fact, more motivated and committed than the men in their units. Finally, some of the officers believe many of the women in their units are more highly skilled or of higher quality than the men, "quality" being a catchall term and not clearly defined by any of the officers.

Table 10-3 also shows that most of the officers who say enlisted women have a negative effect do not give reasons for doing so, but of those who respond, most cite pregnancy and family problems as the primary reason. Almost the same number report inadequate skills and poor quality of the women in their units as a reason. Interestingly, no one cited pregnancy as a factor, although it is mentioned quite often in responses to subsequent interview questions.

TABLE 10-3

REASONS FOR ENLISTED WOMEN'S EFFECTS ON UNIT PERFORMANCE (Current Numbers of Women)

	Percent of All Reasons Cited	
Reason for Effect	Positive/Neutral* Effect	Negative Effect
Group Dynamics**	22%	0%
Motivation/Commitment	10	0
Skills/Quality	7	6
Pregnancy/Family Concerns	0	7
Women Have No Effect	12	0
No Response	0	30
Other	0	4
TOTALS	52	47***

*Neither positive nor negative effect.
**Effect on performance, work environment, morale, and other aspects of social interaction.
***Totals may not sum to 100% because of rounding.

Three of the nine senior officers who believe women currently have a negative effect on their units see it as a serious problem compared to other factors they face in getting the job done. Five believe it is either somewhat of a problem or only a slight problem, and one believes that it is not a problem at all compared to the other factors he cites.

10.4 THE EFFECT OF WOMEN ON UNIT PERFORMANCE ACROSS SEVEN SPECIFIC PERFORMANCE MEASURES

The previous section looked at the effect of enlisted women on general performance in the respondents' units. This section, however, provides a more detailed picture by examining the effect across the following specific indicators of work group performance -- cast into three generally descriptive categories -- that are believed to be correlated with overall unit performance.

Group performance consists of

- Day-to-day performance.

It takes in aspects of work group functioning such as individual output, aptitude and training, and work attitudes.

Availability consists of

- Number of people needed to get the job done;
- Supervisors' flexibility in assigning work; and
- Ability to deploy and mobilize.

This category is concerned with availability in terms of the number of people needed to get the job done as well as scheduling flexibility, both of which may affect deployment and mobility.

Group dynamics consists of

- o Morale;
- o Incidence of sexual harassment; and
- o Number of discipline problems.

Group dynamics is concerned with how well group members function as a unit. Morale is a function of, among other things, pride in self and unit, teamwork, supervision, and working conditions. Sexual harassment undermines individual and thus group morale, and may ultimately have an adverse affect on performance. Finally, the number of discipline problems could be related to morale and sexual harassment as well as supervision.

10.4.1 The Effect Of Women Given Current Numbers

As shown in Table 10-4, 60% of the senior officers believe enlisted women have a positive effect on "Group Performance", given current numbers. In fact, "Day-to-Day Performance" has the highest positive rating of any work group condition measure. Although there is some negative effect, it is minor compared to the positive and neither positive nor negative effects that together constitute over 98% of the responses.

Table 10-4 also shows that 20% of the officers rate enlisted women's effect on "Availability" as positive, one-third the number that give a positive rating to their effect on "Group Performance". Fifty-eight percent of the officers rate their effect as neither positive nor negative. Thus, despite substantially higher negative ratings than those of "Group Performance" and "Group Dynamics", 78% of the senior officers still rate the current effect of enlisted women on "Availability" as either positive or neither positive nor negative.

Among the three specific measures in this category, the effect on the "Number of people needed to get the job done" has the highest number of positive responses at 27% of the total, followed by "Supervisors' flexibility in assigning work" at 20%. However, only 12% give enlisted women a positive rating for their effect on "Ability to Deploy and Mobilize", the lowest of all work group condition measures.

Although 22% of the officers believe enlisted women have a negative effect on "Availability", the split between non-negative and negative responses among the specific measures is not as uniform as it is in the other categories. In particular, one-third fewer officers cite a negative effect on "Number of people needed to get the job done" than on "Supervisors' flexibility in assigning work". The negative ratings of two of the three measures in this category, "Ability to deploy and mobilize" and "Supervisors' flexibility in assigning work", are over ten times greater than those of the other five specific measures. These findings point to existing problem areas that could become more troublesome in the future if the Air Force needed to assimilate substantially more enlisted women.

Forty-four percent of respondents believe women have a positive effect on overall "Group Dynamics". None of the officers cites a negative effect on morale and incidence of sexual harassment, and only a negligible proportion see a negative effect on discipline. Thus, nearly all of the senior officers interviewed believe the effect of women on group dynamics has been either positive or neither positive nor negative, given current numbers.

These findings indicate that from the senior officer's vantage, the presence of women appears to have enhanced unit morale, and might have reduced the number of discipline problems in some units (almost 60% of the officers see women's effect on number of discipline problems as positive). Responses to the sexual harassment measure are more difficult to interpret. The positive effect given the current situation -- about 24% report positive effects and the remainder no effect -- could mean that the increase in women over the past 10 years and their branching out into areas where until recently there were few women has resulted in less harassment.

TABLE 10-4

EFFECTS OF WOMEN ON UNIT PERFORMANCE

	Current Numbers		
Measure	Pos.	Neu.*	Neg.**
Group Performance			
-Day-to-day Performance	60%	38%	2%***
Availability	20	58	22
-Number of people needed to get the job done	27	64	9
-Supervisor's flexibility in assigning work	20	53	27
-Ability to deploy and mobilize	12	58	30
Group Dynamics	44	55	1
-Morale	50	50	0
-Incidence of sexual harassment	24	75	0
-Number of discipline problems	58	40	2

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*Neither positive nor negative effect.
**Cell percentages indicate the proportions of senior officers giving positive, neutral, or negative responses.
***May not equal 100% because of rounding.

10.4.2 General Effect

The reported effects of current numbers of women on the seven group performance indicators in Table 10-4 can be averaged together to obtain a general effect of women on group performance. Table 10-5 presents this average effect along with the officers' ratings of the overall effect of women on unit performance that were summarized in Table 10-2. The two distributions are remarkably similar, suggesting that the seven work group performance measures are correlated with overall unit performance. In general, 85% to 95% of the senior officers interviewed believe that enlisted women currently have a positive or neutral effect on unit performance. In addition, the correspondence between the two sets of responses serves as a consistency check on the officers' responses, a relation that raises our confidence in the data.

TABLE 10-5

GENERAL EFFECT OF ENLISTED WOMEN
(Current Numbers of Women)

	Percent of Senior Officers		
	Positive	Neutral*	Negative
Average Effect on Group Performance (Based on 7 indicators in Table 10-4)	35%	54%	10%**
Overall Effect on Unit Performance (Based on summary statistics in Table 10-2)	35	50	15

*Neither positive nor negative effect.
**May not equal 100% because of rounding.

10.5 SUMMARY

The analysis of the Senior Officer Interview shows that most of the officers believe the chief constraints on a unit's ability to perform its mission successfully are shortages of resources -- personnel and equipment -- and obsolescent facilities. Other factors, particularly the gender-related problems associated with pregnancy and child care, are considerably less important. Furthermore, when specifically asked to gauge the general effect of enlisted women on unit performance, 85% of the officers say it is positive or neither positive nor negative. The most frequently cited reasons for this are (1) that women enhance group performance by fostering a competitive spirit and helping to create a better work environment, and (2) they have thus far been strongly committed to doing a good job.

When asked to evaluate the effect of current numbers of enlisted women on specific unit performance measures, the officers again assign women mostly non-negative ratings. Women have the most positive effect on group dynamics, particularly morale and incidence of sexual harassment, but also have mostly non-negative ratings on measures of performance and availability.

11. SUMMARY

This chapter summarizes the analysis results presented in Chapters 6-9. Rather than recapitulate the summaries concluding each analysis topic, the following discussion examines trends across selected analysis topics: individual commitment, individual performance and availability, and group performance and morale.

The summary first discusses the key analysis variables in terms of the estimated effects on individual and group functioning. Next, group and personal characteristics are summarized in terms of trends signaled by significant results.

11.1 KEY CHARACTERISTICS

Gender. The multivariate analysis examines gender from two perspectives: male-female differences in individual performance and availability; and its group analog, differences in group performance by the concentration of men and women. The results form a consistent and reinforcing picture of the effects of women along specific dimensions of performance and commitment.

Controlling for other personal and group characteristics, the analysis finds that the presence of women has a negative effect on mobility and availability. In particular, women are less able to respond quickly to deployment and are less available for TDY than similarly situated men. From the group perspective, the analysis finds that the likelihood of all members of a group deploying quickly declines as the density of women increases.

In terms of group performance, the analysis finds distinctly more work around in mixed groups than in all-male groups, holding other factors constant. In addition, the likelihood of work around is sensitive to the combination of group size and the proportion of females in the work group. In relatively large groups (more than 13), a greater density of women raises the probability of work around, while in smaller groups it has the reverse effect. Given the presence of work around, males in mixed groups report that the problem becomes more widespread as the proportion of females increases.

In contrast, there is no significant difference between men and women in the propensity to miss scheduled work for personal reasons, or commitment to the Air Force, measured by either a desire to leave before completing an obligated tour of service or career length expectations. The sole exception to this general finding is that enlisted women with at least eight years of service plan to remain in the Air Force two years less than their male counterparts.

Females are more likely, however, to express a desire to transfer out of their work group, even after controlling for other personal and group factors. This propensity may register an individual's dissatisfaction with the group, an interpretation consistent with the finding that women, on average, rate their group lower in terms of morale than do men. Despite this difference in how males and females rate their groups, the mix of men and women *per se* does not exert a pronounced influence on group morale. However, a higher concentration of women is associated with a greater tendency of all enlisted to want to leave the work group.

Family Status. The analysis finds that much of the difference between male and female performance is explained by family status. The family status of group members is also found to influence measures of group performance. The most pervasive result is that pregnant female members and single parents are less able to deploy quickly, are less available for TDY, and tend to miss work more frequently than other personnel. The same effect holds for married women with dependents regarding their availability for mobility and TDY. Group mobility is also affected by the family status of its members, although the relationships are not as strong -- the presence of single women with dependents, members with a military spouse and children, and members with a civilian spouse are estimated to reduce mobility.

There is little systematic relationship between the family status of group members and individual commitment and group morale. The primary effect appears to be limited to Air Force activities that conflict with family responsibilities. One of the chief constraints on women in the work group may be the societal custom that child care responsibilities reside primarily with the female.

Group Size. Group size has a direct effect on several indicators of group functioning: mobility, work around, and morale. Increasing the size of the group, to some extent, raises the chance of at least one member not "carrying his or her own weight". The negative link between mobility, morale, and group size suggests that bigger groups are less cohesive and do not interact as well as smaller groups, an explanation that may also hold for the other indicators.

Sex of Supervisor. Multivariate analysis finds that the sex of a group's supervisor has no statistically significant effect on any of the outcome measures under study. Supervisor gender appears to have a neutral effect on individual and group functioning.

Supervisor Quality. The quality of supervision is strongly related to almost all performance indicators, except individuals' TDY availability and missed work hours. This confirms the key role of leadership at the work group level. However, it may be misleading to infer causality from the empirical results because the analysis relies on a single survey respondent to report on all aspects of group functioning, some of which are based on subjective evaluations. Hence, strong positive or negative feelings about the group could pervade all of the subjective rankings of the respondent, including supervisor quality. The strongest conclusion to draw from the findings is that supervisor quality is highly correlated with virtually all dimensions of performance.

Functional Area. In contrast to some of the tabular analysis, the regression analysis finds little apparent pattern in performance by functional area. This suggests that when other individual and group characteristics are taken into account, a group's functional area is not significantly related to performance (it adds little to the predictive power of the model).

11.2 CHARACTERISTICS OF THE WORK PLACE

The analysis finds a distinct pattern in the level of performance and commitment across important characteristics of the work place: job stress, job pace, personnel shortages, and equipment shortages. The consistent influence of these factors warrant attention, although some may be inherent in a group's mission and not easily changed.

Stressful jobs have an unfavorable effect on individual commitment, group performance, and group morale. Individuals with very stressful jobs are substantially more likely to want to transfer out of their work groups and leave the Air Force early than those whose jobs are not considered stressful. Similarly, individuals with stressful jobs are less likely to deploy quickly and more likely to report work around problems than those in less stressful jobs. In contrast to stressful jobs, fast paced jobs have a favorable effect on individual commitment and group performance and morale, while slow-paced jobs have an unfavorable effect.

Both equipment and personnel shortages have unfavorable effects on individual commitment, group performance, and group morale. This negative finding corroborates the opinions of enlisted personnel and their commanding officers, who consider resource shortages to be key hindrances to mission accomplishment.

Another significant factor is the relative experience level of the group (i.e., the ratio of E1-3s to all enlisted in the group). The lower the experience level, the more likely an individual is to (1) want to transfer from the work group, (2) be unable to deploy quickly, (3) and, perceive a work around problem. Similarly, morale is rated lower in groups with a high proportion of inexperienced individuals. These relationships may have implications for designing the optimal experience mix of the enlisted force.

11.3 INDIVIDUAL CHARACTERISTICS

There do not appear to be any noticeable trends across other individual characteristics tested by the models. Years of service is found to have an effect across the three major analysis areas, but this is expected because, generally, commitment and performance tend to be correlated with experience, and attrition often eliminates poor performers.

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APPENDIX A

MAIN SURVEY QUESTIONNAIRE

U.S. AIR FORCE
SURVEY OF WORK GROUPS

This is a survey about enlisted members, their work, and their work groups. This survey will help the Air Force perform its mission more effectively.

Your answers will be strictly confidential.

Thank you for participating in this survey. Your assistance today is really appreciated.

University of Chicago
NORC
6030 S. Ellis Avenue
Chicago, Illinois 60637

Systems Research and Applications
Corporation
2425 Wilson Blvd.
Arlington, VA 22201

USAF SCN 84-100A

UNITED STATES AIR FORCE

SURVEY OF WORK GROUPS

YOUR WORK GROUP

Many of the questions in this survey ask about your work group. For this survey, think of this as your work group:

> **Your regular work group is the small group of people you work with on a daily basis toward a common group objective or mission.**
>
> **This work group includes the group's supervisor, civilians, reservists, and active duty Air Force members.**

For each type of work group described below, mark "A" for "Yes" on your answer sheet if it is a good description of your work group, and "B" for "No" if it is not.

1. **A STABLE TEAM: A small group of people who usually work together on the same shift.** That is, from 2 to 20 people who work in the same space, for the same supervisor.

   Examples: 14 mechanics and a supervisor in a jet engine shop, who work side-by-side on the engines, 8 hours a day. Or, the "hard crew" of a SAC bomber who always fly together.

   Is this a good description of your type of work group?

   A. Yes

   B. No

---

2. **ALONE OR SMALL GROUP WITHIN A LARGER SHIFT:** People who work alone, or with just a few other people, but who report for work together as part of a group or shift of from 2 to 20 people who work for the same supervisor.

   Examples: (a) An SP attends roll call with 18 other members, but patrols the base alone for the rest of the day. The 19 SPs and the supervisor make up the work group.

   (b) Or, 12 sheet metal workers, including 7 civilians, report together on a shift but work in teams of 4. The 12 workers and the supervisor make up the work group.

   (c) A bus dispatcher, the 9 bus drivers she dispatches and their supervisor are another version of this kind of work group.

   (d) An instructor in a training program, the other instructors, and their supervisor, all working on their own, but with a common mission and on the same shift, are yet another version of this second type of work group.

   Is this a good description of your type of work group?

   A. Yes

   B. No

3. **A CHANGING CREW: A small group of from 2 to 20 that is put together for a specific mission, taking members from larger pools of specialists.**

Example: A transport flight crew that is made up of loadmasters, engineers, and others who fly with different people on each mission.

Is a **changing crew** a good description of your type of work group?

A. Yes

B. No

---

4. **A SUPERVISOR OF SUPERVISORS: A person who is responsible for 1 or more supervisors.**

Examples: A supervisor of a Personnel department where 5 supervisors report directly to him or her. Or, the supervisor of 4 dental teams at the base hospital, each team headed by a supervisor.

Are you **a supervisor of supervisors?**

A. Yes

B. No

---

5. **A "ONE-DEEP" WORKER: A person who works alone and does not belong to a work group.**

Are you a **"one-deep"** worker like this?

A. Yes (RAISE YOUR HAND AND A SURVEY LEADER
WILL GIVE DIRECTIONS)

B. No

6. Which **one** group of those listed above **best** describes your regular work group? Mark the one letter on your answer sheet and write in the message next to it in the box on your answer sheet. You will refer to this message later in the survey.

Type of group (mark **one**)	Write this in the box on your answer sheet:
A. **Small, stable team**	Include all Air Force and civilian members and group supervisor
B. **Alone, or a small group, within a larger shift**	Include all Air Force and civilian members and shift supervisor
C. **Changing Crew**	Include all the people who were part of the crew for the last time you worked
D. **Supervisor of supervisors**	Include yourself, the other supervisors, and support staff you work with regularly. **Do not include the people your supervisors are responsible for.**
E. **"One-deep" person**	Include only the people you work with most often, or work close to. (IF YOU HAVE A QUESTION, RAISE YOUR HAND AND A SURVEY LEADER WILL GIVE DIRECTIONS)
F. **None of the above**	(RAISE YOUR HAND AND A SURVEY LEADER WILL GIVE DIRECTIONS)

---

7. Thinking of the work group as you defined it in the box on your answer sheet, does this group have more than 20 people?

   A. No

   B. Yes (RAISE YOUR HAND AND A SURVEY LEADER WILL GIVE DIRECTIONS)

8. Thinking of the work group as you defined it in the box on your answer sheet, how long have you been assigned to this work group?

A. Less than 1 week
(RAISE YOUR HAND AND THE SURVEY STAFF
WILL GIVE DIRECTIONS)

B. 1 week to less than 1 month

C. 1 month to less than 6 months

D. 6 months to less than 1 year

E. 1 year to less than 2 years

F. 2 years or more

---

9. When was the last full week you worked with that group?

A. Last week

B. 2 - 4 weeks ago

C. More than four weeks ago
(RAISE YOUR HAND AND A SURVEY LEADER WILL
GIVE DIRECTIONS)

---

10. Again, thinking of the work group you defined in the box on the answer sheet, are you the regular supervisor of that group?

A. No

B. Yes

THE PEOPLE IN YOUR WORK GROUP

11. Thinking of the group defined in the box at Q.6, and including yourself, how many people in your work group are:

    A. E-1 to E-3
    B. E-4 to E-6
    C. E-7 to E-9
    D. Officers
    E. Civilians

---

12. Thinking of the group defined in the box, and including yourself, what is the **total** number of people in your work group?

    THIS TOTAL SHOULD EQUAL THE TOTAL OF A THROUGH E IN QUESTION 11.

---

13. How many in your work group (including yourself) are women?

---

14. How many in your work group (including yourself) are Black?

---

15. How many in your work group (including yourself) are Hispanic?

---

16. How many of the men in your work group are single? (IF YOU ARE NOT CERTAIN, GIVE YOUR BEST ESTIMATE; IF YOU DO NOT KNOW, MARK "DON'T KNOW")

---

17. How many of the single men in your work group have dependents who live with them? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

18. How many women in your work group are single? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

19. How many of the single women in your work group have dependents who live with them? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

20. How many of the military people in your work group are married to someone also serving in the military? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

21. How many of these military couples have dependents who live with them? (BEST ESTIMATE OR MARK "DON'T KNOW")

22. How many of the military people in your work group are married to civilian spouses? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

23. How many of these military-civilian couples have dependents who live with them? (BEST ESTIMATE OR MARK "DON'T KNOW")

---

24. How many of the people in your work group have the same specialty area (AFSC) that you have?

A. All have the same AFSC that I have

B. Most have same AFSC that I have

C. About half have the same AFSC

D. Few have the same AFSC that I have

E. No one else has the AFSC that I have

F. Don't know

---

25. Which of the following functional areas best describes **where** you work?

Examples: If you are an administrative specialist working in an aircraft maintenance squadron, mark "N," Weapons Systems Maintenance;

If you are a supply specialist working in a hospital, mark "F," Medical;

If you are a training NCO working in a Civil Engineering squadron, mark "A," Civil Engineering.

(MARK ONE LETTER ON ANSWER SHEET. IF YOU HAVE A QUESTION, RAISE YOUR HAND AND A SURVEY LEADER WILL GIVE DIRECTIONS)

A. Civil Engineering

B. Comptroller (Includes Accounting and Finance)

C. Depot Operations and Maintenance (Includes Material and Logistics Management; Supply and Transportation)

D. Ground Communications, Electrical Operations and Maintenance (Includes Telecommunications/Flight Facilities; Engineering and Installations)

E. Intelligence

F. Medical

G. Operations (Includes Flight Crews and Safety)

H. Manpower and Personnel (Includes Recruiters)

I. Research and Development

J. Security Police

K. Supply, Services and Contracting (Includes Commissary; Morale, Welfare and Recreation; Procurement; Logistic Plans)

L. Training

M. Transportation

N. Weapons System Maintenance (Includes Aircraft, Munitions and Missile Maintenance; Maintenance Standards Evaluation Teams)

O. Command, Administration, Other (Includes Photographic, Judge Advocate, Inspector General, Public Affairs, Chaplains, Band, Mortuary, Cartography, Weather)

YOUR JOB

26. Would you transfer to a different work group on this base if you could, other than for advancement or to change specialty (AFSC)?

   A. Yes (GO TO Q.27)

   B. No (SKIP TO Q.28)

ANSWER ONLY IF YOU SAID YOU WOULD TRANSFER IN Q.26

27. What is the **main** reason you would transfer? (MARK ONE RESPONSE)

   A. Don't like supervisor

   B. Don't like co-workers

   C. Don't like the duties, work tasks, that make up the job

   D. Don't like the physical conditions of the work

   E. Don't like the location of the work

   F. Don't like the hours/shift

   G. Other reason

---

28. Would you transfer to a different work group on this base if you could do a different type of work, other than for advancement or to change specialty (AFSC)?

   A. Yes

   B. No

---

29. If a **male** you know asked about joining your work group, would you recommend it to him?

   A. Yes

   B. No

---

30. If a **female** you know asked about joining your work group, would you recommend it to her?

   A. Yes

   B. No

31. How many days in a week is your work group usually scheduled to work?

A. 1 day

B. 2 days

C. 3 days

D. 4 days

E. 5 days

F. 6 days

G. 7 days

H. Irregular, varies from week to week

---

32. Which of the following best describes your regular working hours within your work group?

A. Day shift (for example, 0700-1600)

B. Evening shift (for example, 1500-2400)

C. Midnight shift (for example, 2300-0800)

D. Extended hours or irregular hours (for example, 24 hours on, 48 hours off)

E. Other

---

33. Would you prefer a different work schedule?

A. No (SKIP TO Q.35)

B. Yes, would prefer a different work schedule (GO TO Q.34)

ANSWER ONLY IF YOU WOULD PREFER A DIFFERENT WORK SCHEDULE

34. If you would prefer a different schedule, why is that? (MARK THE ONE MOST IMPORTANT REASON)

A. To spend more time with my family

B. To solve problems of dependent/child care

C. To make it easier for me to work a second job

D. To go to school

E. To have more time for my social life

F. Other

For each of the following statements, mark the letter shown below that best represents your view about your work group. Mark that letter on your answer sheet.

A = STRONGLY AGREE
B = AGREE
C = NEITHER AGREE NOR DISAGREE
D = DISAGREE
E = STRONGLY DISAGREE

35. Physical strength is necessary to get the work done in my work group.

36. The work that my work group does requires getting our hands very dirty.

37. People in my work group work well together.

38. My work group does a bad job of handling short deadlines and surprise schedule changes.

39. There is a friendly atmosphere in my work group.

40. My co-workers take pride in their work.

41. The workers in my work group are well qualified for the job.

42. My work group produces high quality work.

43. People not showing up for work in my work group is a problem that interferes with getting the work done.

44. There is constant arguing among people in my work group.

45. Changes of personnel in my group hurts our ability to get the job done.

---

46. If your work group were deployed or mobilized, would the members of your work group be able to respond quickly?

A. Yes, all of them

B. Yes, most of them

C. Yes, a few of them

D. None of them

47. In the event of deployment or mobilization, would you personally be able to respond quickly?

A. Yes

B. No

---

48. Would arrangements for your dependents hurt your ability to mobilize quickly? (MARK ONE)

A. Does not apply; I have no responsibility for any dependent care arrangements

B. Yes, for dependent children

C. Yes, for other dependents

D. No

YOUR JOB LAST WEEK

(or the last week you worked in your group)

49. The pace of work in my work group last week was: (MARK ONE)

    A. Very fast

    B. Somewhat fast

    C. Neither fast nor slow

    D. Somewhat slow

    E. Very slow

---

50. The work in my work group last week was: (MARK ONE)

    A. Very stressful

    B. Somewhat stressful

    C. Not very stressful

    D. Not at all stressful

For each item below answer Yes or No, to show whether it describes **where you worked last week, or the last week you worked in your work group** (MARK ONE ANSWER FOR EACH ITEM)

	Yes	No
51. On a flight line	A	B
52. In an airplane (flying)	A	B
53. In a hazardous area	A	B
54. Warehouse/hanger/shop	A	B
55. In an excessively warm or cold area	A	B
56. Out-of-doors	A	B
57. In an office environment	A	B

58. How many days last week did your work group experience an equipment shortage (tools, supplies, and parts)? (MARK ONE RESPONSE ON YOUR ANSWER SHEET)

A. None (SKIP TO Q.60)

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

---

59. How much of a problem did this equipment shortage create for your group, with respect to getting its work done?

A. Very serious problem

B. Serious problem

C. Moderate problem

D. Slight problem

E. Not a problem

---

60. How many days last week did your work group experience personnel shortages? (MARK ONE RESPONSE ON YOUR ANSWER SHEET)

A. None (SKIP TO Q.62)

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

---

61. How much of a problem did this personnel shortage create for your group, with respect to getting its work done?

A. Very serious problem

B. Serious problem

C. Moderate problem

D. Slight problem

E. Not a problem

YOUR SUPERVISOR

If you are a supervisor, answer these questions about the person you report directly to.

62. What is the rank of the supervisor you report to? (MARK ONE RESPONSE ON YOUR ANSWER SHEET)

    A. E-2 to E-3

    B. E-4 to E-6

    C. E-7 to E-9

    D. Officer

    E. Civilian

    F. Don't Know

63. What is this supervisor's race or ethnic group? (MARK ONE)

    A. American Indian/Alaskan Native

    B. Black/Afro-American

    C. Hispanic/Puerto Rican/Mexican/Cuban/Latin/ Chicano/Other Spanish

    D. Oriental/Asian/Chinese/Japanese/Korean/Filipino/ Pacific Islander

    E. White/Caucasian

64. What is this supervisor's sex? (MARK ONE)

    A. Male

    B. Female

65. How long have you been supervised by this person?

    A. Less than 6 months

    B. 6 - 12 months

    C. More than 1 year

For each of the following statements, mark the letter shown below that best represents your opinion. Mark that letter on your answer sheet.

A = STRONGLY AGREE
B = AGREE
C = NEITHER AGREE NOR DISAGREE
D = DISAGREE
E = STRONGLY DISAGREE

My work group supervisor . . .

66. makes sure the work gets done

67. handles disciplinary problems poorly

68. insures that people new to the work group are trained effectively and thoroughly

69. deals poorly with personnel shortages in the work group

70. deals effectively with equipment shortages in the work group

71. encourages me to continue my Air Force career

72. sets a good example for us

73. can be counted on to help me when I have technical questions about my job

74. encourages me to take positions of increased responsibility

75. evaluates accurately, based on performance

76. recommends people for awards when appropriate

77. treats women more favorably than other group members

78. treats men more favorably than other group members

OTHER WORK GROUP ISSUES

Some people in work groups don't always "carry their own weight," or work as hard as they should. There are many reasons for this. For example, they don't have the ability, they don't work hard enough, they have health problems, and so on.

79. In the work group you defined in the box on your answer sheet at Q.6, how many **men** do not "carry their own weight?" (FILL IN NUMBER ON ANSWER SHEET. IF "00," SKIP TO Q.82)

---

80. Why don't these men carry their own weight? (MARK ALL THAT APPLY)

A. They don't have the ability or aptitude
B. They don't work very hard, are lazy
C. They have a temporary health problem
D. They have a long-term health problem
E. They have a drinking/drug problem
F. They are not physically strong enough
G. They miss work too much
H. They haven't had time yet to learn the job
I. They have scheduling conflicts because of outside jobs
J. They have scheduling conflicts because of personal and family reasons
K. Other

---

81. Which of the reasons above is the one main reason the men don't carry their own weight? (MARK ONE LETTER FROM LIST ABOVE)

---

82. In your work group, how many **women** do not "carry their own weight?" (FILL IN NUMBER ON ANSWER SHEET. IF "00," SKIP TO Q.85)

---

83. Why don't these women carry their own weight? (MARK ALL THAT APPLY)

A. They don't have the ability or aptitude
B. They don't work very hard, are lazy
C. They have a temporary health problem
D. They have a long-term health problem
E. They have a drinking/drug problem
F. They are not physically strong enough
G. They miss work too much
H. They haven't had time yet to learn the job
I. They have scheduling conflicts because of outside jobs
J. They have scheduling conflicts because of personal and family reasons
K. They are pregnant (still on the job)
L. They are pregnant (in the hospital) or on maternity leave
M. Women are restricted from some tasks in their duty AFSC by law or by Air Force policy
N. Other

84. Which of the reasons above is the one main reason the women don't carry their own weight? (MARK ONE LETTER FROM LIST ABOVE)

---

85. Are half or more of the members of your work group women?

A. Yes (SKIP TO Q.90)

B. No (GO TO Q.86)

We'd like you to think about the effects on your work group if there were more women in it. Suppose, for instance, the number of women increased to half the work group. (Even if you have no women in your work group, think about it being half women.)

86. Compared with today, if half of my work group were women, the group would respond to **mobilization or deployment:**

A. Much more quickly

B. Somewhat more quickly

C. About the same as now

D. Somewhat more slowly

E. Much more slowly

F. Does not apply; my work group has no mobilization requirement

---

87. Compared with today, if half of my work group were women, the group's **day-to-day performance** would be:

A. Greatly improved

B. Somewhat improved

C. Unchanged (SKIP to Q.89)

D. Somewhat reduced

E. Greatly reduced

88. Why would your work group's performance be affected? (MARK THE ONE MAIN REASON)

A. Strength

B. Aptitude

C. Availability for overtime

D. Availability for TDY

E. Day-to-day availability

F. Attitudes toward the job

G. Ability to get along with others

H. Other

---

89. What would be your own reaction if the number of women in your work group increased to half)? (MARK THE ONE BEST ANSWER)

A. Would prefer to stay in my current work group

B. Wouldn't matter to me

C. Would prefer to transfer out of my current work group

D. Would request to transfer out of my current work group

---

90. What would be the effect of **doubling the current number** of women in the Air Force?

A. It would be a much better Air Force

B. It would be a somewhat better Air Force

C. It would not affect the quality of the Air Force

D. It would be a somewhat worse Air Force

E. It would be a very much worse Air Force

---

91. In the last four weeks of work, have you personally been the victim of verbal harassment or abuse because of your sex (for example, sexist jokes, offensive cursing) by anyone in your work group?

A. Yes, 1 time

B. Yes, 2 times

C. Yes, 3-4 times

D. Yes, 5-6 times

E. Yes, 7 or more times

F. No (SKIP TO Q.93)

92. How did you solve the problem? (MARK THE ONE BEST ANSWER)

A. I did not, the problem continues

B. Did nothing and the problem went away

C. Talked to the person(s) causing the problem

D. Talked with my work group supervisor

E. Talked about the the problem with a friend

F. Talked about the problem with my spouse

G. Talked to a counselor or chaplain

---

93. In the last four weeks of work, have you personally been the victim of physical harassment because of your sex (such as inappropriate physical contact) by anyone in your work group?

A. Yes, 1 time

B. Yes, 2 times

C. Yes, 3 - 4 times

D. Yes, 5 - 6 times

E. Yes, 7 or more times

F. No (SKIP to Q.95)

---

94. How did you solve the problem? (MARK THE ONE BEST ANSWER)

A. I did not, the problem continues

B. Did nothing and the problem went away

C. Talked to the person(s) causing the problem

D. Talked with my work group supervisor

E. Talked about the the problem with a friend

F. Talked about the problem with my spouse

G. Talked to a counselor or chaplain

SUMMING UP

Below are some factors that might affect a group's ability to accomplish its mission. Please evaluate the extent to which each factor is a problem that interferes with your work group's ability to get the job done. Mark the letter that best represents your opinion on each item.

A = VERY SERIOUS PROBLEM
B = SERIOUS PROBLEM
C = MODERATE PROBLEM
D = SLIGHT PROBLEM
E = NO PROBLEM AT ALL

Is _______________ a problem for your work group?

95. Poor supervision
96. Poor working conditions
97. People without enough training/skills
98. Equipment and supply shortages
99. People who don't work hard enough
100. People leaving the work group and new people coming in
101. Men in the work group
102. Too much red tape or paperwork
103. Women in the work group
104. Low morale
105. People without enough strength
106. Alcohol or drug abuse
107. People not showing up for work
108. Single people with dependents
109. Personnel shortages
110. Married people with dependents
111. Pregnancy

---

112. In your judgment, which of the factors cited above (ITEMS 95 THROUGH 111) is the biggest problem, overall? PLEASE FILL IN THE NUMBER OF THAT ITEM IN THE SPACE PROVIDED ON YOUR ANSWER SHEET AT Q.112.

YOUR WORK TIME LAST WEEK

These questions ask you to think about the last full week you worked with your work group. That is, the last Monday through Sunday that you worked. First you're asked how many days you were scheduled to work, then how many hours or days you missed because of various factors.

113. How many days were **you** scheduled to work?

A. 1

B. 2

C. 3

D. 4

E. 5

F. 6

G. 7

---

114. How many **days of annual leave** and **"comp time"** did you take?

A. No days of leave or "comp time"

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

115. How many hours of scheduled work did you miss because of **training you received**?

A. None
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

---

116. How many hours of scheduled work did you miss because of **other Air Force activities** (for example, administrative duties, special functions, details and extra duties)?

A. None
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

117. How many hours of scheduled work did you miss because of **your own** illness or injury?

A. None
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

---

118. How many hours of scheduled work did you miss because of **your own** pregnancy?

A. None or not applicable
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

119. How many hours of scheduled work did you miss because of **family illness** or injury, family problems, or dependent/child care?

A. None
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

---

120. How many hours of scheduled work did you miss because of **personal business**, physical exercise, or other reasons?

A. None
B. 1 hour or less
C. 2 hours
D. 3 hours
E. 4 hours
F. 5 hours
G. 6 - 9 hours
H. 10 - 14 hours
I. 15 - 19 hours
J. 20 - 24 hours
K. 25 - 29 hours
L. 30 - 34 hours
M. 35 - 39 hours
N. 40 hours or more

121. Referring to the hours you actually spent working last week, what percent effort did you give, taking 100% as your maximum effort?

A. 100% effort

B. 95 - 99%

C. 90 - 94%

D. 85 - 89%

E. 80 - 84%

F. 75 - 79%

G. 70 - 74%

H. Under 70% effort

---

122. How many hours **over 40 hours** did you work in your work group last week?

A. None; the job did not require it

B. None; I was asked to, but I was unable to work over 40 hours

C. Less than 5 hours

D. 6 - 9 hours

E. 10 - 14 hours

F. 15 - 19 hours

G. 20 - 24 hours

H. Over 24 hours

---

123. Were you **unable** to go on any TDY in the last 6 months?

A. I was unable at least once (GO TO Q.124)

B. It was not a problem (SKIP TO Q.125)

ANSWER ONLY IF YOU WERE UNABLE TO GO ON TDY IN THE LAST 6 MONTHS

(If more than 1 TDY was missed, answer for the most recent)

124. Why were you unable to go TDY? (MARK THE ONE MAIN ANSWER)

A. Was pregnant

B. Wife was pregnant

C. Personal health problems other than pregnancy

D. Dependent care responsibilities

E. Second job

F. To attend school

G. Other reason

---

125. What is your duty Air Force Specialty Code (AFSC)?

FILL IN THE FIVE NUMBERS OF YOUR AFSC IN THE SPACES PROVIDED ON YOUR ANSWER SHEET (RAISE HAND IF UNSURE)

---

126. How long have you been working in your present **duty** AFSC? (MARK ONE ON YOUR ANSWER SHEET)

A. Less than 1 year

B. 1 year but less than 2

C. 2 years but less than 3

D. 3 years but less than 4

E. 4 years but less than 5

F. 5 years but less than 6

G. 6 years but less than 7

H. 7 years but less than 8

I. 8 years but less than 9

J. 9 years but less than 10

K. 10 years or more

127. How long have you been assigned to your current base?

A. Less than 6 months

B. 6 but less than 12 months

C. 12 but less than 24 months

D. 24 but less than 36 months

E. 36 but less than 48 months

F. 48 or more months

---

128. How many more years do you expect to serve on active duty in the Air Force?

A. less than 1 year

B. 1 more year

C. 2 more years

D. 3 more years

E. 4 more years

F. 5 more years

G. 6 to 10 years

H. 11 to 15 more years

I. 16 or more years

J. Undecided about how many more years I plan to stay in the Air Force.

---

129. How do you feel about leaving the Air Force **before** your term of service is up? (MARK ONE)

A. Do not want to leave

B. Would like to leave if I could before my term of service is up

C. I am taking advantage of an "early out" program

BACKGROUND ABOUT YOU

130. What is your sex?

A. Male

B. Female

---

131. What do you consider to be your main racial or ethnic group? (MARK ONE ANSWER ON YOUR ANSWER SHEET)

A. American Indian/Alaskan Native

B. Black/Afro-American

C. Hispanic/Puerto Rican/Mexican/Cuban/Latin/Chicano/Other Spanish

D. Oriental/Asian/Chinese/Japanese/Korean/Filipino/Pacific Islander

E. White/Caucasian

---

132. When were you born?

A. 1967

B. 1966

C. 1965

D. 1964

E. 1963

F. 1962

G. 1961

H. 1960

I. 1959

J. 1958

K. 1957

L. 1956

M. 1955

N. 1954

O. 1953

P. 1952

Q. 1951

R. 1950

S. 1945-1949

T. 1940-1944

U. 1939 and before

---

133. What is the highest level of education that you have completed? (MARK ONE ANSWER)

A. Some high school (did not graduate)

B. High school graduate (no college)

C. GED equivalent (no college)

D. Civilian trade or technical school (no college)

E. Some college (less than a college degree)

F. College degree (BS, BA, or equivalent)

G. Graduate work beyond bachelor degree

134. Where do you live?

A. On-base, in group quarters or barracks

B. On-base, in a house, apartment, or mobile home

C. Off-base, renting

D. Off-base, own/buying home

E. Off-base, government leased housing

F. Off-base, other

135. In what branch of the service did your **mother, or female guardian,** serve?

A. None

B. Air Force

C. Army

D. Navy

E. Marine Corps

F. Coast Guard/Merchant Marine

G. Only in the National Guard or Reserve, no active duty

136. In what branch of the service did your **father, or male guardian,** serve?

A. None

B. Air Force

C. Army

D. Navy

E. Marine Corps

F. Coast Guard/Merchant Marine

G. Only in the National Guard or Reserve, no active duty

137. What is your current marital status?

A. Single, never married (SKIP TO Q.140)
B. Married, active duty military spouse (GO TO Q.138)
C. Married, military spouse in Guard/Reserves (GO TO Q.138)
D. Married, civilian spouse (GO TO Q.138)
E. Separated, military spouse (SKIP TO Q.139)
F. Separated, civilian spouse (SKIP TO Q.139)
G. Divorced (SKIP TO Q.140)
H. Widowed (SKIP TO Q.140)

---

138. Is your spouse living with you now?

A. Yes
B. No, due to Air Force requirement that no command-sponsored dependents permitted
C. No, Air Force requirements prevented my military spouse from being assigned to this location
D. No, due to marital problems
E. No, due to spouse's civilian career
F. No, due to our preference, or some other reason

---

139. What is your **spouse's** current military pay grade, or what was her/his highest pay grade?

A. Spouse has never been in the military
B. E-1 or E-2
C. E-3
D. E-4
E. E-5
F. E-6
G. E-7 through E-9
H. 0-1
I. 0-2
J. 0-3
K. 0-4
L. 0-5
M. 0-6 through 0-10

140. How many adult dependents (age 18 and over) live with you, including your spouse?

A. None

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

I. 8 or more

---

141. How many children (age less than 18) live with you?

A. None

B. 1

C. 2

D. 3

E. 4

F. 5

G. 6

H. 7

I. 8 or more

---

142. Are you, or your spouse, currently pregnant?

A. No

B. Yes

C. Not applicable

143. What is your military pay grade?

A. E-1
B. E-2
C. E-3
D. E-4
E. E-5
F. E-6
G. E-7
H. E-8
I. E-9

---

144. How much total active federal military service have you completed?

A. Less than 1 year
B. 1 year but less than 2
C. 2 years but less than 3
D. 3 years but less than 4
E. 4 years but less than 5
F. 5 years but less than 6
G. 6 years but less than 7
H. 7 years but less than 8
I. 8 years but less than 9
J. 9 years but less than 10
K. 10 years but less than 15
L. 15 years but less than 20
M. 20 years or more

---

145. Do you currently work at a civilian job or at your own business during your off-duty hours?

A. No, and I am **not seeking** additional employment
(SKIP TO Q.147)

B. No, but I **am seeking** additional employment
(SKIP TO Q.147)

C. Yes, I'm self-employed or have my own company

D. Yes, I work for another company or organization

E. Yes, I work for an Air Force activity

ANSWER ONLY IF YOU HAVE A CIVILIAN JOB

146. In the last full week (Monday through Sunday), or the last full week you worked in your work group, how many hours did you actually spend on your civilian job?

A. Less than 10 hours

B. 10 - 19

C. 20 - 29

D. 30 - 39

E. 40 - 49

F. 50 or more

G. Did not work at all during that week

---

147. What is your **total monthly family income, before taxes?** Please include all military and civilian income, interest and dividends, rent, Social Security, pensions, alimony and child support, unemployment compensation and public aid, received by everyone in your family.

Family refers to yourself and anyone living with you who is related to you by marriage, blood, or adoption.

A. $500 to $999 per month

B. $1,000 to $1,499

C. $1,500 to $1,999

D. $2,000 to $2,499

E. $2,500 to $2,999

F. $3,000 to $3,499

G. $3,500 to $3,999

H. $4,000 to $4,499

I. $4,500 to $4,999

J. $5,000 or more

148. Did you complete this survey during a group administration where other people were taking the same survey, in a mail survey, or in a personal interview with an interviewer?

A. Group administration

B. Mail survey

C. Personal interview

STOP!

If you are a supervisor, go to the next section of this survey.

If you are not a supervisor, you have completed the survey. Thank you for your cooperation. (PLEASE RAISE YOUR HAND AND A SURVEY LEADER WILL COLLECT YOUR ANSWER SHEET.)

If you have any comments on this survey, or suggestions for improving the performance or mobilization ability of your work group, please write your comments on paper available from the survey leader, and hand it in with your answer sheet.

THANK YOU!

FOR REGULAR SUPERVISORS ONLY

NOT PEOPLE WHO JUST SOMETIMES FILL IN AS SUPERVISORS

ALL OTHERS HAVE FINISHED THE SURVEY

IMPORTANT NOTE:
If you are a **supervisor of supervisors** you should answer the remaining questions about all the people you are responsible for, not just the work group you defined in the box on the answer sheet.

149. Altogether, including civilians and military personnel, how many people are you responsible for? (RECORD YOUR ANSWER ON THE ANSWER SHEET)

150. Of the total number of people you are responsible for how many are military (regular Air Force, not civilians or reserves)? (RECORD YOUR ANSWER ON THE ANSWER SHEET)

151. Of the total number of people you are responsible for, how many are women? (RECORD YOUR ANSWER ON THE ANSWER SHEET)

Thinking about all the people you are responsible for, what is the effect of having women in that group, for each issue below. Mark the letter that best represents your views on each item.

A = VERY GOOD
B = GOOD
C = NEITHER GOOD NOR BAD
D = BAD
E = VERY BAD
F = DOES NOT APPLY; GROUP IS ALREADY HALF WOMEN OR MORE

On organizational morale within the group you are responsible for:

152. What is the effect of women, given their current numbers?

153. What would be the effect of women, if their numbers were increased to half of the group?

On day-to-day performance within the group you are responsible for:

154. What is the effect of women, given their current numbers?

155. What would be the effect of women, if their numbers were increased to half?

On people staying in the group and not transferring out:

156. What is the effect of women, given their current numbers?

157. What would be the effect of women, if their numbers were increased to half?

(Continued from page 34)

Thinking about all the people you are responsible for, what is the effect of having women in that group, for each issue below. Mark the letter that best represents your views on each item.

A = VERY GOOD
B = GOOD
C = NEITHER GOOD NOR BAD
D = BAD
E = VERY BAD
F = DOES NOT APPLY; GROUP IS ALREADY HALF WOMEN OR MORE

On the number of incidents of sexual harassment within the group you are responsible for:

158. What is the effect of women, given their current numbers?

159. What would be the effect of women, if their numbers were increased to half?

On the ability to deploy and mobilize within the group you are responsible for:

160. What is the effect of women, given their current numbers?

161. What would be the effect of women, if their numbers were increased to half?

On people not showing up for work within the group you are responsible for:

162. What is the effect of women, given their current numbers?

163. What would be the effect of women, if their numbers were increased to half?

On the number of people needed to get the job done within the group you are responsible for:

164. What is the effect of women, given their current numbers?

165. What would be the effect of women, if their numbers were increased to half?

On the number of discipline problems within the group you are responsible for:

166. What is the effect of women, given their current numbers?

167. What would be the effect of women, if their numbers were increased to half?

On a supervisor's flexibility in assigning work within the group you are responsible for:

168. What is the effect of women, given their current numbers?

169. What would be the effect of women, if their numbers were increased to half?

This completes the questionnaire for supervisors. Thank you for taking the time to participate. If you have additional comments on this survey or on the performance or mobilization ability of your work group, please write your comments on paper available from the survey leader, and hand it in with your answer sheet. (PLEASE RAISE YOUR HAND AND A SURVEY LEADER WILL COLLECT YOUR MATERIALS)

THANK YOU!

APPENDIX B

INTERVIEW GUIDE FOR ENLISTED PERSONNEL

B

Interview Guide for Enlisted Personnel

Interviewer Preparation
You must have a main survey quex to refer to during the interview. Respondent must have a main survey quex and be given his or her answer sheet from the main survey to refer to.

Introduction
Thank you for meeting me for this interview. We appreciate the time you've already given us in filling out the questionnaire in the group session, and we've planned this interview to take no more than another half hour of your time.

The purpose of this interview is to learn about some of the issues covered in the earlier questionnaire in more detail than we can ask for in a paper-and-pencil survey. A computer was used to randomly select 37 names from the list of 488 enlisted people on your base who are filling out the other questionnaire. These 37 people, yourself included, are the ones who are being interviewed.

Do you have any questions? Let's begin.

Office use__ __-__ __ __ __ __
1-2 3-7

Questions

1. The survey asked you to choose a category to describe your type of work group. Which type of work group did you say you are a part of?
    01. Small stable team
    02. Alone, or a small group, within a larger shift
    03. Changing crew
    04. Supervisor of supervisors
    05. "One-deep" or solitary worker
    06. Some other type of work group (SPECIFY:)________________

8-9/

2. One of the survey questions (Q.26) asked if you would transfer to a different work group on this base if you could, other than for advancement or to change specialty (AFSC).
How did you answer that question? Would you transfer from your current work group if you could?
    1. Yes (GO TO Q.3)
    2. No (SKIP TO Q.6)

10/

3. What was the main reason that you gave for this?
   01. Don't like the supervisor
   02. Don't like co-workers
   03. Don't like the duties, work tasks, that make up the job
   04. Don't like the physical conditions of the work 11-12/
   05. Don't like the location of the work
   06. Don't like the hours/shift
   07. Other reason

4. What is it specifically about (THE MAIN REASON) that would make you want to transfer?____________________

____

________________________Office use__ __ 13-14/

5. Do you have any other reasons for wanting to transfer from your work group?
   1. Yes (SPECIFY. THEN SKIP TO Q.7)____________________ 15/

____

________________________Office use__ __ 16-17/

   2. No (SKIP TO Q.7)

(ONLY ASK IF "NO" TO Q.2)

6. What is it about your work group that makes you want to stay rather than transfer? (SPECIFY)____________________

______________________________ 18-19/

________________________Office use__ __

7. If you had all the authority and resources you needed, how would you change your work group to improve its day-to-day performance?

____

______________________________ 20-21/

________________________Office use__ __

Some people in work groups do not "carry their own weight" because they do not have the ability, don't work hard enough, they have health problems, and so on.

Please refer back to your answers to survey Q.s79-84

8. Did you report that your work group had a problem with any men not carrying their own weight (Q.79)? 22/
   1. Yes (GO TO Q.9)
   2. No (SKIP TO Q.11)

9. How does your work group handle this kind of problem?

Office use__ __ 23-24/

10. How much is this (men not carrying their own weight) a problem in getting the work done in your work group?

1. Very serious problem
2. Serious problem 25/
3. Moderate problem
4. Slight problem
5. No problem at all

11. Now please refer to your answer to Q.82 on the other survey. Did you report that your work group had a problem with any women not carrying their own weight? 26/

1. Yes (GO TO Q.12)
2. No (SKIP TO Q.14)

12. How does your work group handle this kind of problem?

27-28/

Office use__ __

13. How much is this (women not carrying their own weight) a problem in getting the work done in your work group?

1. Very serious problem
2. Serious problem 29/
3. Moderate problem
4. Slight problem
5. No problem at all

14. Now I'd like to ask you two questions about a hypothetical situation. The first asks about the effects of increases in the number of women in your work group on the group's ability to mobilize, and the second asks about the effects on the group's day-to-day performance.

14. (Continued) First, considering the group's day-to-day performance.... If the female percentage of your work group were increased from its current level, is there any point at which the percentage of women would begin to have an effect on the group's day-to-day performance? (PROBE IN THIS ORDER: YES OR NO; IF YES, WHETHER EFFECT IS POSITIVE OR NEGATIVE; IF YES, PERCENTAGE POINT AT WHICH EFFECT OCCURS)

1. YES, A **POSITIVE** EFFECT (SPECIFY PERCENTAGE POINT OF POSITIVE EFFECT AND GO TO Q.15)____________ 30/
2. YES, A **NEGATIVE** EFFECT (SPECIFY PERCENTAGE POINT OF NEGATIVE EFFECT AND GO TO Q.15)____________ 31-33/
3. NO POINT AT WHICH PERFORMANCE WOULD BE AFFECTED ONE WAY OR ANOTHER (SKIP TO Q.17)

15. Why would there be an effect at that point? What's the most important reason for your answer?____________________

____ 34-35/

____________________________________Office use.___ ___

16. Is there some point beyond (READ PERCENTAGE POINT R GAVE IN Q.14) at which the number of women would begin to have another, opposite effect? (CIRCLE LETTER OF R'S RESPONSE; IF YES, PROBE FOR PERCENT)

1. YES, THE EFFECT OF EVEN MORE WOMEN WOULD SHIFT TO BECOME **POSITIVE** AT ________ PERCENT (FILL IN PERCENT) 36/
2. YES, THE EFFECT OF EVEN MORE WOMEN WOULD SHIFT TO BECOME **NEGATIVE** AT ________ PERCENT (FILL IN PERCENT) 37-39/
3. NO, THERE WOULD BE NO CHANGE IN THE EFFECT OF WOMEN AT HIGHER NUMBERS OF WOMEN

17. Now, considering the group's ability to mobilize quickly.... If the female percentage of your work group were increased from its current level, is there any point at which the percentage of women would begin to have an effect on the group's ability to **rapidly mobilize**? (PROBE IN THIS ORDER: YES OR NO; IF YES, WHETHER EFFECT IS POSITIVE OR NEGATIVE; IF YES, PERCENTAGE POINT AT WHICH EFFECT OCCURS)

1. YES, A **POSITIVE** EFFECT (SPECIFY PERCENTAGE POINT OF POSITIVE EFFECT AND GO TO Q.18)____________ 40/
2. YES, A **NEGATIVE** EFFECT (SPECIFY PERCENTAGE POINT OF NEGATIVE EFFECT AND GO TO Q.18)____________ 41-43/
3. NO POINT AT WHICH PERFORMANCE WOULD BE AFFECTED ONE WAY OR ANOTHER (SKIP TO Q.20)

18. Why would there be an effect at that point? What's the most important reason for your answer?____________________

__________________________________ office use__ __ 44-45/

____

19. Is there some point beyond (READ PERCENTAGE POINT R GAVE IN Q.17) at which the number of women would begin to have another, opposite effect? (CIRCLE LETTER OF R'S RESPONSE; IF YES, PROBE FOR PERCENT) 46/

1. YES, THE EFFECT OF EVEN MORE WOMEN WOULD SHIFT TO BECOME POSITIVE AT ______ PERCENT (FILL IN PERCENT)
2. YES, THE EFFECT OF EVEN MORE WOMEN WOULD SHIFT TO BECOME NEGATIVE AT ______ PERCENT (FILL IN PERCENT) 47-49/
3. NO, THERE WOULD BE NO CHANGE IN THE EFFECT OF WOMEN AT HIGHER NUMBERS OF WOMEN

If the number of women in your work group was increased substantially over the next couple of years, what are the most important positive and negative things that would happen in your work group?

20. Let's begin with the **positive** outcomes. I can take up to three.

1.____________________________ office use__ __ 50-51/
2.____________________________ office use__ __ 52-53/
3.____________________________ office use__ __ 54-55/

21. What are the most important **negative** things that might happen?

1.____________________________ office use__ __ 56-57/
2.____________________________ office use__ __ 58-59/
3.____________________________ office use__ __ 60-61/

22. In your opinion, which of the **positive** things you described would be temporary, and which would be long-lasting outcomes? (READ LIST GIVEN BY R TO Q.20. CIRCLE LETTER OF ANSWER BELOW)

ITEM 1 IN 20. = 1. Temporary 2. Long-lasting 3. Not applicable 62/
ITEM 2 IN 20. = 1. Temporary 2. Long-lasting 3. Not applicable 63/
ITEM 3 IN 20. = 1. Temporary 2. Long-lasting 3. Not applicable 64/

23. In your opinion, which of the **negative** things you described would be temporary, and which would be long-lasting outcomes? (READ LIST GIVEN BY R TO Q.21)

ITEM 1 IN 21. =	1. Temporary	2. Long-lasting	3. Not applicable	65/
ITEM 2 IN 21. =	1. Temporary	2. Long-lasting	3. Not applicable	66/
ITEM 3 IN 21. =	1. Temporary	2. Long-lasting	3. Not applicable	67/

24. As the Air Force is examining the number of men and women in work groups, are there any things that we have not addressed in this survey that you think are important, and that the Air Force should take into account?

____

____

____

____ Office use___ ___ 68-69/

Thank you very much for your time and help. Your comments will be kept strictly confidential. Thank you again.

Sex of Respondent: M F 70/

Sex of Interviewer: M F 71/

Answer sheet #:___ ___ ___ ___ ___

72-80/R

APPENDIX C

SENIOR OFFICERS INTERVIEW GUIDE

READEX FICHE pages tightly bound

TIME:________

Senior Officers Interview Guide:
Study of Work Groups

Introduction

Thank you for finding the time to meet with me today. I know that you are very busy, so we have designed this interview to take no more than half an hour.

First, I'd like to give you some brief background on the survey NORC is conducting on your base this week.

The survey takes a look at many different aspects of the performance of the small working groups that make up the day-to-day work force of the Air Force. The goal is to determine what factors affect work group performance and efficiency. The three major areas of the survey deal with working conditions, male-female issues, and supervision.

Do you have any questions?

Questions

I'd like to begin my questionning by asking your views about the factors that affect performance in your organization.

1. Many factors may make it harder for a unit to perform its mission. Based on your **experience at this base,** what have you found to be the most important factors or conditions that make it harder to get the job done, or make it difficult to operate in the most efficient way possible, within the organization you are responsible for?

Here is a list of possible factors that some people have mentioned in the early stages of our research. You may have others in mind--these are only possibilities. I can take up to five factors on my reporting form: (HAND SHOW CARD A TO RESPONDENT. LIGHTLY CHECK SPACE NEXT TO FACTORS MENTIONED)

___1 Equipment/parts shortages
___2 Insufficient manpower authorizations/ personnel shortages
___3 Personnel turnover
___4 Inadequate training
___5 Paperwork/red tape
___6 Work group supervision
___7 Single people with dependents
___8 Married people with dependents
___9 Married military couples
___10 People with second jobs
___11 Health problems, injuries
___12 Pregnancy
___13 Bad weather
___14 Other (SPECIFY:)____________________________
____
___15 Other (SPECIFY:)____________________________
____
___16 Other (SPECIFY:)____________________________
____

2. Please tell me the rank order of importance of the factors you mentioned, with 1 as the most important. (READ BACK TO R ALL ITEMS CHECKED IN Q.1. WRITE THE RANK ASSIGNED TO EACH CHECKED ITEM IN THE SPACE TO THE LEFT OF THE ITEM.)

3. How does the presence of enlisted women affect getting the job done in the organization you're responsible for? Would you say the presence of women has: (CIRCLE LETTER OF R'S ANSWER)

A. a very positive effect,
B. a somewhat positive effect,
C. neither a positive nor a negative effect
D. a somewhat negative effect, or
E. a very negative effect?

(IF C TO Q.3, SKIP TO Q.6. ALL OTHERS GO TO Q.4)

4. Why does the presence of enlisted women have that effect?

(IF R GAVE NEGATIVE ANSWER (D OR E) TO Q.3, GO TO 5. ALL OTHERS SKIP TO Q.6)

5. Compared to the factors you just mentioned, how would you evaluate the presence of enlisted women as a factor that makes it harder to get the job done?

Would you say that the presence of enlisted women is: (CIRCLE LETTER OF R'S ANSWER)

A. a very serious problem,
B. a serious problem,
C. somewhat of a problem,
D. a slight problem, or
E. no problem at all?

6. The remainder of this interview focuses on issues related to women, for two reasons. First, the Air Force needs the insights of its senior officers to complement the enlisted survey data. Together this information will help us to distinguish between facts and fiction about the effects of women on the functioning of the Air Force.

Second, as you may know, Congress asked for a review of the Air Force's ability to utilize women. To properly fulfill this Congresional mandate, the Air Force is examining the presence of women as one of several factors that affect overall performance.

Considering the entire organization that you are responsible for, what is the effect of having enlisted women in that group, for each of the following issues that I describe to you? Please look at these response categories, and read to me the letter that best represents your views on each issue. (HAND SHOW CARD B TO RESPONDENT. WRITE HIS RESPONSE IN THE SPACE TO THE LEFT OF EACH ITEM)

A = Very good
B = Good
C = Neither good nor bad
D = Bad
E = Very Bad
F = Does not apply; group is already half women or more

On morale within the organization you are responsible for:

______7. What is the effect of women, given their current numbers?

______8. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On day-to-day performance within the organization you are responsible for:

______9. What is the effect of women, given their current numbers?

______10. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On the number of incidents of sexual harrassment within the organization you are responsible for:

______11. What is the effect of women, given their current numbers?

______12. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On the ability to deploy and mobilize within the organization you are responsible for:

_____13. What is the effect of women, given their current numbers?

_____14. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On the number of people needed to get the job done:

_____15. What is the effect of women, given their current numbers?

_____16. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On the number of discipline problems within the organization:

_____17. What is the effect of women, given their current numbers?

_____18. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

On supervisors' flexibility in assigning work within the organization you are responsible for:

_____19. What is the effect of women, given their current numbers?

_____20. What would be the effect of women, if their numbers were increased to half across all functional areas in your organization?

21. Currently the female percentage of all enlisted personnel is about 11 percent, although it varies across organizations. If the female percentage of the enlisted force were increased from its current level, is there any point at which the percentage of women in your organization would begin to have an effect upon the organization's ability to perform its mission? (CIRCLE LETTER OF RESPONSE)

A. Yes, a positive effect (SPECIFY PERCENTAGE POINT OF POSITIVE EFFECT AND GO TO Q.22)_______

B. Yes, a negative effect (SPECIFY PERCENTAGE POINT OF NEGATIVE EFFECT AND GO TO Q.22)_______

C. No (SKIP TO Q.24)

22. Why would there be an effect at that point? What's the most important reason? (RECORD ANSWER VERBATIM)____________________

____

____

23. Is there some point beyond (READ PERCENTAGE POINT R GAVE IN Q.21) at which the number of women would begin to have another, opposite effect? (CIRCLE LETTER OF R'S RESPONSE AND FILL IN PERCENT)

A. Yes, the effect of even more women would shift to become **positive** at _____percent (FILL IN PERCENT)

B. Yes, the effect of even more women would shift to become **negative** at _____percent (FILL IN PERCENT)

C. No, there would be no change in the effect of women at higher numbers of women

Up to now we have focused exclusively on enlisted personnel. What would be the overall effect on the organization that you are responsible for if the current percentage of women officers were increased to half across all functional areas (except for those affected by combat exclusion rules)? Using the same response card as before, please tell me: (HAND SHOW CARD B TO RESPONDENT)

24.______ What would be the effect on day-to-day performance? (WRITE LETTER IN SPACE)

25.______What would be the effect on **mobility** and **deployment responsiveness**? (WRITE LETTER IN SPACE)

26. As the Air Force is examining the number of men and women in the service, are there any things we have not addressed in this interview that you feel are important, and should be brought to the attention of the Air Force? (SPECIFY:)

____

____

____

____

____

____

27. Finally, if the Air Force were to increase the number of women substantially over the next three years, what steps would you recommend be taken to facilitate the transition to more women? That is, what mechanisms or policies would you recommend be adopted? (SPECIFY:)

____

____

____

____

____

Thank you so much for your frank and clear responses. Your views, along with those of the other 59 senior officers NORC will interview on a total of 30 bases, will be a great help to those in the Air Force with responsibilities to make plans and decisions in the areas we talked about.

Before I go, may I please take a minute to make sure that I have all of my facts in order?

28. How many years have you served in the Air Force? __________years

29. How long have you been at this base, in your present position?
____________years

That concludes my questioning. Again, thank you very much for your time and help.

TIME:__________

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